

UNITED STATES AIR FORCE
ARMSTRONG LABORATORY

Missile Launch Facility Sewage Lagoon
Sludge Survey Minot Air Force Base,
North Dakota (ACC)

Doris A. Dohner, Master Sergeant, USAF

May 1998

19980808071

Approved for public release;
distribution is unlimited.

Occupational and Environmental Health
Directorate
Bioenvironmental Engineering Division
2402 E Drive
Brooks Air Force Base TX 78235-5114

DTIG QUALITY INSPECTED 3

NOTICES

When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely Government-related procurement, the United States Government incurs no responsibility or any obligation whatsoever. The fact that the Government may have formulated or supplied the said drawings, specifications, or other data, is not to be regarded by implication, or otherwise in any manner construed, as licensing the holder or any other person or corporation; or as conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

The office of Public Affairs has reviewed this report, and it is releasable to the National Technical Information Service, where it will be available to the general public, including foreign nationals.

Government agencies and their contractors registered with Defense Technical Information Center (DTIC) should direct requests for copies to: DTIC, 8725 John J. Kingham Rd., STE 0944, Ft. Belvoir, VA 22060-6218.

Non-Government agencies may purchase copies of this report from: National Technical Information Services (NTIS), 5285 Port Royal Road, Springfield VA 22161-2103.



WILLIAM J. GOODEN, Maj, USAF, BSC
Chief, Water Quality Branch



LARRY T. KIMM, Maj, USAF, BSC
Chief, Bioenvironmental Engineering Division

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188
<p>Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.</p>			
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED	
	May 1998	Final 3 - 7 November 1997	
4. TITLE AND SUBTITLE		5. FUNDING NUMBERS	
Missile Launch Facility Sewage Lagoon Sludge Survey Minot Air Force Base, North Dakota (ACC)			
6. AUTHOR(S)			
MSgt Doris A. Dohner			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)		8. PERFORMING ORGANIZATION REPORT NUMBER	
Detachment 1 Human Systems Center (AFMC) Occupational and Environmental Health Directorate Bioenvironmental Engineering Division 2402 E Drive Brooks AFB, TX 78235		AL-OE-BR-TR-1998-0016	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES			
12a. DISTRIBUTION AVAILABILITY STATEMENT		12b. DISTRIBUTION CODE	
Approved for public release: distribution unlimited			
13. ABSTRACT (Maximum 200 words)			
<p>A missile launch facility sewage lagoon sludge survey was conducted at Minot Air Force Base, North Dakota, during the week of 3 - 7 November 1997. The survey was the result of a request from the 5 Civilian Engineering Squadron, Environmental Flight (5 CES/CEV). The purpose of the sludge sampling request was to determine the amount of arsenic, cadmium, copper, lead, mercury, nickel, selenium, zinc, ammonia, Total Kejldahl Nitrogen (TKN), nitrate/nitrite, percent solids and fecal coliform colonies in the sludge layer at each missile site's primary and secondary sewage lagoon. Minot AFB is located approximately 13 miles north of Minot, North Dakota. It occupies approximately 7.2 square miles of contiguous property and also operates 150 off-site Minuteman III missile launch facilities (LFs) and 15 missile alert facilities (MAFs). Metal sample results indicate the metals of concern in the sludge from both primary and secondary sewage lagoons are below both Ceiling Concentration Limits and "High Quality" Pollutant Concentration Limits in the 40 CFR 503. The geometric mean of seven discrete fecal coliform samples from each of the primary and secondary sewage lagoons at all sites are less than 2,000,000 CFU/g TS.</p>			
14. SUBJECT TERMS		15. NUMBER OF PAGES	
Arsenic Cadmium Chromium Copper Lead Molybdenum Nickel Selenium Zinc Mercury TKN Ammonia Nitrates/nitrite Percent Solid Colony Forming Units		80	
		16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

	<u>Page</u>
List of Tables	iii
INTRODUCTION.....	1
DISCUSSION	
Background.....	1
SAMPLE RESULTS.....	5
CONCLUSION.....	5
APPENDICES:	
A Sample Results Missile Sites A1 to J1.....	8
B Chain of Custody Forms	13
C Formulas and Calculations.....	55
D Sample Results Missile Site K1 and L1	67
E Survey Field Notes.....	69
F References	71

TABLES

<u>Table No.</u>	<u>Page</u>
1 Land Application Pollutant Limits	2
2 Primary Pond Sampling and Missile Site Location Identification	3
3 Secondary Pond Sampling and Missile Site Location Identification	4
3 Sampling Parameters and Analysis Method.....	5

(In Appendices)

<u>Table No.</u>	<u>Page</u>
A-1 Missile Site A1 and B1	8
A-2 Missile Site C1 and D1	9
A-3 Missile Site E1 and F1.....	10
A-4 Missile Site G1 and H1.....	11
A-5 Missile Site I1 and J1.....	12
D-1 Missile Site K1and L1	68

THIS PAGE INTENTIONALLY LEFT BLANK

Missile Launch Facility Sewage Lagoon Sludge Survey Minot Air Force Base, North Dakota (ACC)

INTRODUCTION

A missile launch facility sewage lagoon sludge survey was conducted at Minot Air Force Base, North Dakota, during the week of 3 to 7 November 1997, by personnel from the Water Quality Branch of Detachment 1, Human System Center's Bioenvironmental Engineering Division (Det 1 HSC/OEBW). The survey was the result of a request from the 5th Civilian Engineering Squadron, Environmental Flight (5th CES/CEV). The purpose of the survey was to determine if sludge meets class B land application criteria.

DISCUSSION

Background

The Det 1 HSC/OEBW survey team was lead by MSgt Doris Dohner with technical assistance provided by MSgt Mary Fields. Other team members included: Mr. Jeff Lambrecht and Dr. Deb Hunter 5 CES/CEV, SSgt Doug Hammes 5 CES/CEOIU, and MSgt Michael Riha 91 OG/OGV.

Geographically, Minot AFB is located approximately 13 miles north of Minot, North Dakota. It occupies approximately 7.2 square miles of contiguous property and also operates 150 off-site Minuteman III missile launch facilities (LFs) and 15 missile alert facilities (MAFs). The MAFs are designated as missile sites A1 – O1. During this survey sludge samples were collected from the primary and secondary ponds at missile sites A1-G1 and I1 – J1. Sludge samples were collected from the primary sewage lagoon at missile site H1. This site does not have a secondary lagoon. Upon request additional sludge samples were also collected at missiles sites K1 and L1.

The base is home to the 5th Bomb Wing (5 BW) of the Eighth Air Force in the U.S. Air Force Combat Command (ACC). The 5 BW is composed of the 5th Operations Group (5 OG), 5th Logistics Group, 5th Support Group, and 5th Medical Group. The 5 OG consists of the 23rd Bomb Squadron (B-52 bombers) and the 5th Operational Support Squadron (RAPCON and Base Operations). The base has the capability to support 37 B-52 aircraft.

The base is also home to the 91st Space Wing of the Air Force Space Command. The 91st Space Wing is composed of the 91st Operations Group and 91st Logistics Group (91 LG). The 91 LG consists of the 740th, 741st, and 742nd Missile Squadrons, 91st Maintenance Squadron, and the 54th Rescue Flight helicopters. Minot AFB is responsible for the operation and maintenance of the Minuteman III Missiles located

outside the perimeter of the base, but within the 100-mile radius. The Minuteman III missile is an intercontinental ballistic missile.

MAFs have topside and underground rooms with crews to perform missile control operations 24 hours a day. A garage is located adjacent to each MAF and contains non-essential support materials. Twelve to fifteen personnel are at each of the MAFs. Each LF houses a missile and launch-associated support equipment. All LFs are built entirely under ground.

Land application of bulk sewage sludge must meet pollutant Ceiling Concentration and Cumulative Pollutant Loading Rates or Pollution Concentration limits in the 40 Code of Federal Regulations (CFR) 503. The limitations are listed in table 1.

TABLE 1: Land Application Pollutant Limits

Table in 503 Rule	Table #1	Table #2	Table #3	Table #4
Pollutant	Ceiling Concentration Limits* (mg/kg)	Cumulative Pollutant Loading** Rates (kg/ha)	"High Quality" Pollutant Concentration Limits*** (mg/kg)	Annual Pollutant Loading Rates**** (kg/ha/yr)
Arsenic	75	41	41	2.0
Cadmium	85	39	39	1.9
Copper	4,300	1,500	1,500	75
Lead	840	300	300	15
Mercury	57	17	17	0.85
Molybdenum	75	N/A	N/A	N/A
Nickel	420	420	420	21
Selenium	100	100	100	5.0
Zinc	7,500	2,800	2,800	140

* Absolute values

** This establishes the maximum kilograms per hectare of each regulated pollutant that can be land-applied during the life time of the site.

*** Monthly averages

**** Based on a 365 day time period

All limits are on dry weight basis

CFR 503 classifies sludge as either A or B. To classify sludge as A the sludge must be treated by one of six methods listed in CFR 503. For a B sludge classification the sludge must be analyzed by one of three methods to determine the sludge pathogenic content. The indicator organism method was used to determine the pathogenic content and classifies this sludge as B. Fecal coliform was as the chosen indicator organism. For class B sewage sludge analysis requires seven sludge samples be collected at the time of use or disposal. The geometric mean of the densities of the sample will be calculated and should meet the following criteria:

- Less than 2,000,000 Most Probable Number per gram of total dry solids (2,000,000 MPN/g TS).
Or
- Less than 2,000,000 Colony Forming Units per gram of total dry solids (2,000,000 CFU/g TS).

Sampling Strategy: Table 2 and 3 identify the sites where sludge was sampled.

TABLE 2. Primary Pond Sampling and Missile Site Location Identificatoin

Site # Assigned by OEBW	Primary Pond Missile Site Identification #
1	A1
3	B1
5	C1
7	D1
9	E1
11	F1
13	G1
15	H1
16	H1 Duplicate
17	I1
19	J1
	Collected from Sludge Pile at Missile Site #
21	K1
23	L1

TABLE 3. Secondary Pond Sampling and Missile Site Location Identification

Site # Assigned by OEBW	Secondary Pond Missile Site Identification
2	A1
4	B1
6	C1
8	D1
10	E1
12	F1
14	G1
18	I1
20	J1
	Collected from Spread Sludge at Missile Site #
22	L1

One discrete sample from each location was submitted to Minnesota Valley Testing Laboratory (MVTL) for fecal coliform analysis. A composite sample consisting of equal portions from each of the four corners and three sample locations in the center of the pond was collected at each sewage lagoon. Two composite samples from each site were obtained by mixing equal portions of the sludge from the seven discrete samples. One composite sludge sample from each site was submitted to Detachment 1, Human System Center, Occupational and Environmental Analytical Services Division (Det 1 HSC/OEA) for metals. The second composite from each site was also submitted to Det 1 HSC/OEA for ammonia, total kjeldahl nitrogen (TKN), total nitrate/nitrite and percent solids. Table 4 lists the sampling methods MVTL and Det 1 HSC/OEA used to analyze the sludge samples.

TABLE 4 Sampling Parameters and Analysis Method

SAMPLING PARAMETER	SAMPLE ANALYSIS METHOD
Arsenic	SW 3050/6010B
Cadmium	SW 3050/6010B
Chromium	SW 3050/6010B
Copper	SW 3050/6010B
Lead	SW 3050/6010B
Molybdenum	SW 3050/6010B
Nickel	SW 3050/6010B
Selenium	SW 3050/6010B
Zinc	SW 3050/6010B
Mercury	SW 7471A
Percent Solids	Standard Method 2540G
Ammonia	EPA Method 350.1
Kjeldahl Nitrogen	EPA Method 351.2
Nitrate/Nitrite	EPA Method 353.2
Fecal Coliform	Standard Method 9222D

SAMPLE RESULTS

MISSILE SITE A1 – J1: The results of all metal analysis on sludge from all the missile site primary and secondary sewage lagoons (see Appendix A) indicate all metals of concern in the sludge are below both Ceiling Concentration Limits and "High Quality" Pollutant Concentration Limits in the 40 CFR 503 (see table 4 above). See Appendix A for ammonia, TKN, and total nitrates/nitrate sample results. Prior to land application the site in which this sludge will be land applied must be sampled for those parameters of concern in CFR 503. These sludge sample results will then be used to determine if the sludge can be applied at the chosen site. The geometric mean (see Appendix A) of seven discrete fecal coliform samples from each of the primary and secondary sewage lagoons at all sites are less than 2,000,000 CFU/g TS (See appendix A, Tables A-1 to A-5).

CONCLUSION

MISSILE SITE A1 – J1: Based on the sludge sample results, sludge from all sewage lagoons at all missile sites A1-J1 can be classified as Class B High Quality under 40 CFR 503. All sludge is eligible for land application.

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix A

Minot Air Force Base, North Dakota

Table A-1 Missile Site A1 and B1

Missile Site Sewage Lagoon Sludge Sampling Survey: 3 to 7 November 1997

Date Collected:		November 3, 1997			
Analysis Method	Analytes (ug/G)	Missile Site A1		Missile Site B1	
		Primary Pond	Secondary Pond	Primary Pond	Secondary Pond
SW 3050/6010B	Arsenic	3.5	4.83	3.9	4.98
SW 3050/6010B	Cadmium	1.13	1.46	0.2	1.49
SW 3050/6010B	Chromium	8.1	11	1.9	10.6
SW 3050/6010B	Copper	45.1	26.6	7.4	25.9
SW 3050/6010B	Lead	7	10.6	<3.4	12.8
SW 3050/6010B	Molybdenum	<0.5	<0.60	<1.0	<0.60
SW 3050/6010B	Nickel	16.1	22.9	4.9	20.4
SW 3050/6010B	Selenium	<1.7	<2.0	<3.4	<2.0
SW 3050/6010B	Zinc	70	74.9	15.6	138
SW 7471A	Mercury	0.129	0.083	0.097	0.098
STD MTD 2540G	Solids (%)	1.7	54.4	0.7	80.8
	milligrams/Liter Total Solids mg/L TS	0.017	0.544	0.007	0.808
EPA 350.1	Ammonia (mg/G)	888	<0.004	4429	<0.004
EPA 351.2	Kjeldahl Nitrogen (mg/G)	1529	0.06	6000	0.048
EPA 353.2	Nitrate/Nitrate Total (mg/G)	<6	0.01	<14	0.1
Fecal Coliform Locations of Sample Collection					
Method 9222 D	Location A (CFU/100ml) / CFU/g TS	<10 / <0.0017	<10 / <0.0544	6000 / 0.42	<10 / <0.0808
Method 9222 D	Location B (CFU/100ml) / CFU/g TS	10000 / 1.7	<10 / <0.0544	10000 / 0.7	<10 / <0.0808
Method 9222 D	Location C (CFU/100ml) / CFU/g TS	30000 / 5.1	1000 / 5.44	11000 / 0.77	<10 / <0.0808
Method 9222 D	Location D (CFU/100ml) / CFU/g TS	50000 / 8.5	<10 / <0.0544	18000 / 1.26	<10 / <0.0808
Method 9222 D	Location E (CFU/100ml) / CFU/g TS	10000 / 1.7	<10 / <0.0544	6000 / 0.42	<10 / <0.0808
Method 9222 D	Location F (CFU/100ml) / CFU/g TS	15000 / 2.55	<10 / <0.0544	7000 / 0.49	40000 / 323.2
Method 9222 D	Location G (CFU/100ml) / CFU/g TS	4000 / 0.68	<10 / <0.0544	7000 / 0.49	<10 / <0.0808
Geometric Mean					
	Colony Forming Unit/100ml sample				
	CFU/100ml	5102.1	<19.31	8604.72	<32.7
	Colony Forming Unit/grams Total Soli	<0.87	<0.11	0.6	<0.26
	CFU/g TS				
	Base Sample #	GL970531	GL970538	GL970545	GL970552
		GL970532	GL970539	GL970546	GL970553
		GL970533	GL970540	GL970547	GL970554
		GL970534	GL970541	GL970548	GL970555
		GL970535	GL970542	GL970549	GL970556
		GL970536	GL970543	GL970550	GL970557
		GL970537	GL970544	GL970551	GL970558
	OEHL Sample #	98004475	98004499	98004477	98004478
			98004476		98004501
	MVTL Laboratories Sample #	97-L27334	97-L27341	97-L27348	97-L27355
		97-L27335	97-L27342	97-L27349	97-L27356
		97-L27336	97-L27343	97-L27350	97-L27357
		97-L27337	97-L27344	97-L27351	97-L27358
		97-L27338	97-L27345	97-L27352	97-L27359
		97-L27339	97-L27346	97-L27353	97-L27360
		97-L27340	97-L27347	97-L27354	97-L27361
CFU/100/ml -Colony Forming Units per 100 milliliter of sample					
CFU/g TS - Colony Forming Units per gram of Total Solids					

Minot Air Force Base, North Dakota

Table A-2 Missile Site C1 and D1

Missile Site Sewage Lagoon Sludge Sampling Survey: 3 to 7 November 1997

Date Collected:	November 3, 1997				
Analysis Method	Analytes (ug/G)	Missile Site C1		Missile Site D1	
		Primary Pond	Secondary Pond	Primary Pond	Secondary Pond
SW3050/6010B	Arsenic	2.31	4.68	<2.2	5.06
SW3050/6010B	Cadmium	0.49	1.85	<0.43	1.92
SW3050/6010B	Chromium	3.07	15.2	<4.3	12.4
SW3050/6010B	Copper	20.1	30.8	13.9	31.2
SW3050/6010B	Lead	2.9	13.1	<8.7	11.2
SW3050/6010B	Molybdenum	<0.53	<0.60	3.2	<0.91
SW3050/6010B	Nickel	6.84	25.8	<4.3	25.6
SW3050/6010B	Selenium	<1.8	<2.0	<8.7	<3.0
SW3050/6010B	Zinc	49.1	2.1	<22	195
SW7471A	Mercury	0.102	0.055	0.207	<0.061
STD MTD 2540G	Solids (%)	2.6	66.8	8.9	51.2
	milligrams/Liter Total Solids mg/L TS	0.026	0.668	0.089	0.512
EPA 350.1	Ammonia (mg/G)	1127	<0.004	163	12
EPA 351.2	Kjeldahl Nitrogen (mg/G)	1846	0.13	337	22
EPA 353.2	Nitrate/Nitrate Total (mg/G)	<4	0.02	3	3
Fecal Coliform	Locations of Sample Collection				
Method 9222 D	Location A (CFU/100ml) / CFU/g TS	3000 / 0.78	<10 / <0.0668	1000 / 0.89	<10 / <0.0512
Method 9222 D	Location B (CFU/100ml) / CFU/g TS	4000 / 1.04	<10 / <0.0668	5000 / 4.45	<10 / <0.0512
Method 9222 D	Location C (CFU/100ml) / CFU/g TS	1600000 / 416	<10 / <0.0668	1100 / 0.979	80000 / 409.6
Method 9222 D	Location D (CFU/100ml) / CFU/g TS	300000 / 78	<10 / <0.0668	15000 / 13.35	<10 / <0.0512
Method 9222 D	Location E (CFU/100ml) / CFU/g TS	1000 / 0.26	<10 / <0.0668	13000 / 11.57	<10 / <0.0512
Method 9222 D	Location F (CFU/100ml) / CFU/g TS	1000 / 0.26	<10 / <0.0668	1000 / 0.89	<10 / <0.0512
Method 9222 D	Location G (CFU/100ml) / CFU/g TS	1000 / 0.26	<10 / <0.0668	3000 / 2.67	30000 / 153.6
Geometric Mean	Colony Forming Unit/100ml sample				
	CFU/100ml	9242.18	<10	3170	<36.11
	Colony Forming Unit/grams Total Solids		2.4	<0.0668	2.82
	CFU/g TS				<0.588
	Base Sample #	GL970559	GL970566	GL970573	GL970580
		GL970560	GL970567	GL970574	GL970581
		GL970561	GL970568	GL970575	GL970582
		GL970562	GL970569	GL970576	GL970583
		GL970563	GL970570	GL970577	GL970584
		GL970564	GL970571	GL970578	GL970585
		GL970565	GL970572	GL970579	GL970586
	OEHL Sample #	98004479	98004480	98004481	98004482
			98004503		
	MVTL Laboratories Sample #	97-L27362	97-L27369	97-L27376	97-L27383
		97-L27363	97-L27370	97-L27377	97-L27384
		97-L27364	97-L27371	97-L27378	97-L27385
		97-L27365	97-L27372	97-L27379	97-L27386
		97-L27366	97-L27373	97-L27380	97-L27387
		97-L27367	97-L27374	97-L27381	97-L27388
		97-L27368	97-L27375	97-L27382	97-L27389
CFU/100/ml -Colony Forming Units per 100 milliliter of sample					
CFU/g TS - Colony Forming Units per gram of Total Solids					

Minot Air Force Base, North Dakota

Table A-3 Missile Site E1 and F1

Missile Site Sewage Lagoon Sludge Sampling Survey: 3 to 7 November 1997

Date Collected:		November 4, 1997			
Analysis Method	Analytes (ug/G)	Missile Site E1		Missile Site F1	
		Primary Pond	Secondary Pond	Primary Pond	Secondary Pond
SW 3050/6010B	Arsenic	4	3.79	3.2	3.41
SW 3050/6010B	Cadmium	1.42	1.44	0.394	1.57
SW 3050/6010B	Chromium	10.2	10.1	2.57	9.3
SW 3050/6010B	Copper	61.7	24.8	11.7	29.7
SW 3050/6010B	Lead	8.8	10.2	2.1	11.5
SW 3050/6010B	Molybdenum	<0.66	<0.60	<0.55	<0.60
SW 3050/6010B	Nickel	20.4	20.3	6.33	20.7
SW 3050/6010B	Selenium	<2.2	<2.0	<1.8	<2.0
SW 3050/6010B	Zinc	98.1	109	68.2	204
SW 7471A	Mercury	<0.0095	0.052	<0.037	0.073
STD MTD 2540G	Solids (%)	0.4	65.9	2.9	48.7
	milligrams/Liter Total Solids mg/L TS	0.004	0.659	0.029	0.487
EPA 350.1	Ammonia (mg/G)	3875	<0.004	931	0.15
EPA 351.2	Kjeldahl Nitrogen (mg/G)	6000	0.02	1448	0.32
EPA 353.2	Nitrate/Nitrate Total (mg/G)	25	0.014	3	0.026
Fecal Coliform					
Locations of Sample Collection					
Location A (CFU/100ml) / CFU/g TS					
5000 / 0.2 <10 / <0.0659					
Location B (CFU/100ml) / CFU/g TS					
6000 / 0.24 <10 / <0.0659					
Location C (CFU/100ml) / CFU/g TS					
1000000 / 40 <10 / <0.0659					
Location D (CFU/100ml) / CFU/g TS					
47000 / 1.88 <10 / <0.0659					
Location E (CFU/100ml) / CFU/g TS					
10000 / 0.4 <10 / <0.0659					
Location F (CFU/100ml) / CFU/g TS					
10000 / 0.4 <10 / <0.0659					
Location G (CFU/100ml) / CFU/g TS					
12000 / 0.48 <10 / <0.0659					
Geometric Mean					
Colony Forming Unit/100ml sample					
CFU/100ml					
20813.4 <10 24128.29 <10					
Colony Forming Unit/grams Total Solids					
0.833 <0.0659 7 <0.0487					
CFU/g TS					
Base Sample #					
GL970587 GL970594 GL970601 GL970608					
GL970588 GL970595 GL970602 GL970609					
GL970589 GL970596 GL970603 GL970610					
GL970590 GL970597 GL970604 GL970611					
GL970591 GL970598 GL970605 GL970612					
GL970592 GL970599 GL970606 GL970613					
GL970593 GL970600 GL970607 GL970614					
OEHL Sample #					
98004483 98004484 98004485 98004486					
98004507 98004509					
MVTL Laboratories Sample #					
97-L27549 97-L27556 97-L27563 97-L27570					
97-L27550 97-L27557 97-L27564 97-L27571					
97-L27551 97-L27558 97-L27565 97-L27572					
97-L27552 97-L27559 97-L27566 97-L27573					
97-L27553 97-L27560 97-L27567 97-L27574					
97-L27554 97-L27561 97-L27568 97-L27575					
97-L27555 97-L27562 97-L27569 97-L27576					
CFU/100/ml -Colony Forming Units per 100 milliliter of sample					
CFU/g TS - Colony Forming Units per gram of Total Solids					

Minot Air Force Base, North Dakota

Table A-4 Missile Site G1 and H1

Missile Site Sewage Lagoon Sludge Sampling Survey: 3 to 7 November 1997

Date Collected:		November 4, 1997			
Analysis Method	Analytes (ug/G)	Missile Site G1		Missile Site H1	
		Primary Pond	Secondary Pond	Primary Pond	Primary Pond Dup.
SW 3050/6010B	Arsenic	4.6	4.39	3.5	3.22
SW 3050/6010B	Cadmium	1.19	1.46	1.46	1.08
SW 3050/6010B	Chromium	9.8	10.6	6.6	6
SW 3050/6010B	Copper	24.1	24.8	69.1	47.9
SW 3050/6010B	Lead	8.1	11.8	14.4	9.8
SW 3050/6010B	Molybdenum	<0.67	<0.60	<0.60	<0.60
SW 3050/6010B	Nickel	17.7	21.4	16	13.5
SW 3050/6010B	Selenium	<2.2	<2.0	<2.0	<2.0
SW 3050/6010B	Zinc	136	173	382	175
SW 7471A	Mercury	<0.011	0.076	0.366	0.135
STD MTD 2540G	Solids (%)	0.9	83.2	10.2	5.1
	milligrams/Liter Total Solids mg/L TS	0.009	0.832	0.102	0.051
EPA 350.1	Ammonia (mg/G)	2922	<0.004	515	726
EPA 351.2	Kjeldahl Nitrogen (mg/G)	4444	0.044	628	980
EPA 353.2	Nitrate/Nitrate Total (mg/G)	<11	0.005	<1	<2
<hr/>					
Fecal Coliform	Locations of Sample Collection				
	Location A (CFU/100ml) / CFU/g TS	1000 / 0.09	<10 / <0.0832	4000 / 4.08	2000 / 1.02
	Location B (CFU/100ml) / CFU/g TS	1000 / 0.09	<10 / <0.0832	2000 / 2.04	3000 / 1.53
	Location C (CFU/100ml) / CFU/g TS	230000 / 20.7	<10 / <0.0832	1000 / 1.02	2000 / 1.02
	Location D (CFU/100ml) / CFU/g TS	68000 / 6.12	<10 / <0.0832	2000 / 2.04	4000 / 2.04
	Location E (CFU/100ml) / CFU/g TS	16000 / 1.44	<10 / <0.0832	3000 / 3.06	1000 / 0.51
	Location F (CFU/100ml) / CFU/g TS	3000 / 0.27	<10 / <0.0832	3000 / 3.06	6000 / 3.06
	Location G (CFU/100ml) / CFU/g TS	7000 / 0.63	<10 / <0.0832	3000 / 3.06	3000 / 1.53
Geometric Mean	Colony Forming Unit/100ml sample				
	CFU/100ml	9121.84	<10	2379.57	2627.25
	Colony Forming Unit/grams Total Solids	0.82	<0.0832	2.43	1.34
	CFU/g TS				
	Base Sample #	GL970615	GL970622	GL970629	GL970636
		GL970616	GL970623	GL970630	GL970637
		GL970617	GL970624	GL970631	GL970638
		GL970618	GL970625	GL970632	GL970639
		GL970619	GL970626	GL970633	GL970640
		GL970620	GL970627	GL970634	GL970641
		GL970621	GL970628	GL970635	GL970642
	OEHL Sample #	98004487	98004488	98004489	98004490
			97004511		
	MVTL Laboratories Sample #	97-L27577	97-L27584	97-L27591	97-L27598
		97-L27578	97-L27585	97-L27592	97-L27599
		97-L27579	97-L27586	97-L27593	97-L27600
		97-L27580	97-L27587	97-L27594	97-L27601
		97-L27581	97-L27588	97-L27595	97-L27602
		97-L27582	97-L27589	97-L27596	97-L27603
		97-L27583	97-L27590	97-L27597	97-L27604

CFU/100/ml -Colony Forming Units per 100 milliliter of sample

CFU/g TS - Colony Forming Units per gram of Total Solids

Minot Air Force Base, North Dakota

Table A-5 Missile Site I1 and J1

Missile Site Sewage Lagoon Sludge Sampling Survey: 3 to 7 November 1997

Date Collected:		November 5, 1997			
Analysis Method	Analytes (ug/G)	Missile Site I1		Missile Site J1	
		Primary Pond	Secondary Pond	Primary Pond	Secondary Pond
SW 3050/6010B	Arsenic	3.93	4.35	2.26	5.41
SW 3050/6010B	Cadmium	1.28	1.24	0.21	1.36
SW 3050/6010B	Chromium	8.8	8.9	1.2	8.9
SW 3050/6010B	Copper	104	25.8	6.2	23
SW 3050/6010B	Lead	11.4	9.6	<1.5	10.6
SW 3050/6010B	Molybdenum	<0.60	<0.60	<0.45	<0.060
SW 3050/6010B	Nickel	21.6	18.9	3.68	21.4
SW 3050/6010B	Selenium	<2.0	<2.0	<1.5	<2.0
SW 3050/6010B	Zinc	116	100	72.5	159
SW 7471A	Mercury	0.081	0.074	0.035	0.07
STD MTD 2540G	Solids (%)	6	82		74.6
	milligrams/Liter Total Solids mg/L TS	0.06	0.82	0.021	0.746
EPA 350.1	Ammonia (mg/G)	350	0.01		<0.004
EPA 351.2	Kjeldahl Nitrogen (mg/G)	467	0.042		0.044
EPA 353.2	Nitrate/Nitrate Total (mg/G)	<2	0.006		0.064
<hr/>					
Fecal Coliform	Locations of Sample Collection				
	Location A (CFU/100ml) / CFU/g TS	12000 / 7.2	<10 / <0.082	3000 / 0.63	<10 / <0.0746
	Location B (CFU/100ml) / CFU/g TS	23000 / 13.8	<10 / <0.082	3000 / 0.63	<10 / <0.0746
	Location C (CFU/100ml) / CFU/g TS	100000 / 60	<10 / <0.082	23000 / 4.83	<10 / <0.0746
	Location D (CFU/100ml) / CFU/g TS	20000 / 12	<10 / <0.082	130000 / 27.3	<10 / <0.0746
	Location E (CFU/100ml) / CFU/g TS	10000 / 6	<10 / <0.082	50000 / 10.5	<10 / <0.0746
	Location F (CFU/100ml) / CFU/g TS	10000 / 6	<10 / <0.082	1000 / 0.21	<10 / <0.0746
	Location G (CFU/100ml) / CFU/g TS	20000 / 12	<10 / <0.082	3000 / 0.63	<10 / <0.0746
<hr/>					
Geometric Mean	Colony Forming Unit/100ml sample				
	CFU/100ml	19581.81	<10	8784.46	<10
	Colony Forming Unit/grams Total Solids	11.75	<0.082	1.84	<0.0746
	CFU/g TS				
	Base Sample #	GL970643	GL970650	GL970657	GL970664
		GL970644	GL970651	GL970658	GL970665
		GL970645	GL970652	GL970659	GL970666
		GL970646	GL970653	GL970660	GL970667
		GL970647	GL970654	GL970661	GL970668
		GL970648	GL970655	GL970662	GL970669
		GL970649	GL970656	GL970663	GL970670
	OEHL Sample #	98004491	98004492	98004493	98004494
			98004515		94004517
<hr/>					
	MVTL Laboratories Sample #	97-L27696	97-L27703	97-L27710	97-L27717
		97-L27697	97-L27704	97-L27711	97-L27718
		97-L27698	97-L27705	97-L27712	97-L27719
		97-L27699	97-L27706	97-L27713	97-L27720
		97-L27700	97-L27707	97-L27714	97-L27721
		97-L27701	97-L27708	97-L27715	97-L27722
		97-L27702	97-L27709	97-L27716	97-L27723

CFU/100/ml -Colony Forming Units per 100 milliliter of sample

CFU/g TS - Colony Forming Units per gram of Total Solids

Appendix B

CHAIN OF CUSTODY RECORD

Project Officers:

MSgt Doris A. Dohner

Customer Address/Phone: (210) 536-3305

2402 E Drive Brooks AFB TX 78235

Project Title:

Minor Sld (PID)

Sampler (print):

MSgt D. Dohner

Signature:

Base Sample No.

CL970664 98004494

Date

Time

DEGREES CELCIUS

Site 205

Site 20

Site 21

Site 22

Site 23

Number of Contaminants

Received At:

Analysis Request

Site Location	Waste Name or Description	Received by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Received by: (Signature)
	Mercury SW-7471							
	Nickel, Selenium							
	Zinc SW-6010							
	Lead, Molybdenum							
	Copper SW-6010							
	Cadmium, Chromium							
	Arsenic SW-7060/7061							
	Chromium SW-6010/60101							
	Nitrate + Nitrite							
	TKN or Organic N							
	SUS-841							
	% Soluble in Water							

CHAIN OF CUSTODY

14

All analysis results must be dry weight basis. See Attached

INORGANIC ANALYSIS REQUEST FORM			AL/OEA USE ONLY	
DATE/TIME COLLECTED: <u>9/11/3</u>		YY/MM/DD	24 HR	Mail CHAIN OF CUSTODY LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626 <u>10/08</u>
DATE/TIME RECEIVED: <u> </u>		YY/MM/DD	24 HR	
Reason Submitted: <input type="checkbox"/> (F3 For Selection)		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: <u> </u> System Number: <u> </u>		
<input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst)		AUTHORIZATION NUMBER: <u> </u>		
<input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) <input type="checkbox"/> CHAIN OF CUSTODY (Tracking Purposes)		Sampling Site Identifier: <u> </u>		
ON-SITE ANALYTICAL RESULTS				
WATER TEMPERATURE °C	pH units	COLLECTION METHOD <input type="checkbox"/> GRAB <input type="checkbox"/> COMPOSITE		
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C, E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate				
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: <u> </u>				
SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN FAX				
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: <u> </u>				
SIGNATURE <u>RECEIVED</u>				
MAIL REPORTS TO: <i>(USE ASSIGNED BASE CODE)</i>		ORIGINAL		
		COPY 1		
		COPY 2		
BASE SAMPLE NUMBER: <u>GL 970531</u>		Armstrong Lab PID: <u> </u> (AL Use Only) <u> </u>		
Date/Time Analysed:		Date/Time Analysed:		
GROUP A Holding Time		GROUP G Holding Time		
<input type="checkbox"/> COD	28 Days	410.4	mg/L	Acidity, Total 14 Days 305.1 mg/L
<input type="checkbox"/> Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total 14 Days 310.2 mg/L
Date/Time Analysed:		Date/Time Analysed:		
GROUP B Holding Time		Date/Time Analysed:		
<input type="checkbox"/> Oil & Grease	28 Days	413	mg/L	Alkalinity, Bicarbonate 14 Days 310.1 mg/L
<input type="checkbox"/> TPH	28 Days	418.1	mg/L	Bromide 28 Days 300.0 mg/L
Date/Time Analysed:		Date/Time Analysed:		
GROUP C Holding Time		Date/Time Analysed:		
<input type="checkbox"/> Ammonia <u>11/18</u>	28 Days	350.1	mg/L	Chloride 28 Days 325.2/300.0 mg/L
<input type="checkbox"/> Kjeldahl Nitrogen	28 Days	351.2	mg/L	Color 48 Hrs 110.2 Units
<input type="checkbox"/> Nitrate + Nitrite <u>1/20</u>	28 Days	353.2/300.0	mg/L	Fluoride 28 Days 340.2/300.0 mg/L
<input type="checkbox"/> Nitrate	48 Hrs	353.2/300.0	mg/L	Residue, Total 7 Days 160.3 mg/L
<input type="checkbox"/> Nitrite	48 Hrs	353.2/300.0	mg/L	Residue, Filterable 7 Days 160.1 mg/L
<input type="checkbox"/> Orthophosphate	28 Days	365.1/300.0	mg/L	Residue, Nonfilterable 7 Days 160.2 mg/L
<input type="checkbox"/> Phosphorus, Total	28 Days	365.1/300.0	mg/L	Residue, Settleable 48 Hrs 160.5 ml/L
Date/Time Analysed:		Date/Time Analysed:		
GROUP D Holding Time		Date/Time Analysed:		
<input type="checkbox"/> Cyanide, Total	14 Days	335.3	mg/L	Residue, Volatile 7 Days 160.4 mg/L
<input type="checkbox"/> Cyanide, Free	14 Days	335.1	mg/L	Silica 28 Days 370.1 mg/L
Date/Time Analysed:		Date/Time Analysed:		
GROUP E Holding Time		Date/Time Analysed:		
<input type="checkbox"/> Phenols	28 Days	420.2	ug/L	Specific Conductance 28 Days 120.1 Umhos
Remarks: <u>90 SOLID</u> <u>11/18/97</u> <u>By Weight</u> <u>1.7%</u>		APPROVED BY: <u>Mark Davis</u>		
PREVIOUS EDITION IS OBSOLETE				

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM

AL/OEA
USE
ONLY

CHAIN OF CUSTODY

DATE/TIME COLLECTED: 97/11/3
YY/MM/DD 24 HRDATE/TIME RECEIVED: _____
YY/MM/DD 24 HR

Mail Samples To:

ARMSTRONG LABORATORY
Occupational & Environmental Health Directorate
2402 E. Drive, Bldg 140
Brooks AFB, Texas 78235-5114
DSN: 240-3626 (210) 536-3626Reason Submitted:
(F3 For Selection)IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?
System Name: _____

ROUTINE PRIORITY (pre-arrange with analyst)

CHAIN OF CUSTODY CHAIN OF CUSTODY
(Litigation Purposes) (Tracking Purposes)

AUTHORIZATION NUMBER:

Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE °C pH units COLLECTION METHOD GRAB COMPOSITE

BASE WHERE SAMPLE COLLECTED

HOW WAS THE SAMPLE PRESERVED? Group A-C,E:Sulfuric Acid
 Group D:Sodium Hydroxide Group G:None Group J:Zinc Acetate

SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room

SAMPLE LOCATION:

 Source Pt of Entry Distribution Other: _____

SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN

WATER TREATMENT:

 Raw Chlorination Fluoridation Other: _____

SIGNATURE

MAIL REPORTS TO:

ORIGINAL

(USE ASSIGNED BASE CODE)

COPY 1

COPY 2

BASE SAMPLE
NUMBER:

GL970538

Armstrong Lab PID:
(AL Use Only)Date/Time
Analysed:

GROUP A Holding Time

COD 28 Days 410.4 mg/L
Organic Carbon 28 Days 415.1 mg/LDate/Time
Analysed:

GROUP B Holding Time

Oil & Grease 28 Days 413 mg/L
TPH 28 Days 418.1 mg/LDate/Time
Analysed:

GROUP C Holding Time

Ammonia 11/18 28 Days 350.1 mg/L
Kjeldahl Nitrogen 28 Days 351.2 mg/L

Nitrate + Nitrite 11/20 28 Days 353.2/300.0 mg/L

Nitrate 48 Hrs 353.2/300.0 mg/L
Nitrite 48 Hrs 353.2/300.0 mg/LOrthophosphate 28 Days 365.1/300.0 mg/L
Phosphorus, Total 28 Days 365.1/300.0 mg/LDate/Time
Analysed:

GROUP D Holding Time

Cyanide, Total 14 Days 335.3 mg/L
Cyanide, Free 14 Days 335.1 mg/LDate/Time
Analysed:

GROUP E Holding Time

Phenols 28 Days 420.2 mg/L

Date/Time
Analysed:

GROUP G Holding Time

Acidity, Total 14 Days 305.1 mg/L
Alkalinity, Total 14 Days 310.2 mg/L

Alkalinity, Bicarbonate 14 Days 310.1 mg/L

Bromide 28 Days 300.0 mg/L

Chloride 28 Days 325.2/300.0 mg/L

Color 48 Hrs 110.2 Units

Fluoride 28 Days 340.2/300.0 mg/L

Residue, Total 7 Days 160.3 mg/L

Residue, Filterable 7 Days 160.1 mg/L

Residue, Nonfilterable 7 Days 160.2 mg/L

Residue, Settleable 48 Hrs 160.5 ml/L

Residue, Volatile 7 Days 160.4 mg/L

Silica 28 Days 370.1 mg/L

Specific Conductance 28 Days 120.1 Umho

Sulfate 28 Days 375.2/300.0 mg/L

Surfactants-MBAS 48 Hrs 425.1 mg/L

Turbidity 48 Hrs 180.1 Units

Langlier Index 28 Days 203

Date/Time
Analysed:

GROUP J Holding Time

Sulfides 7 Days 376.1 mg/L

CHEMIST: *Blair* APPROVED BY: *Mark*

Remarks: 9% SOLID BY WEIGHT: 54.4% CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM			AL/OEA USE ONLY	CHAIN OF CUSTODY					
DATE/TIME COLLECTED: <u>9/7/11/13</u> YY/MM/DD 24 HR		Mail Samples To: <u>100</u>		ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626					
DATE/TIME RECEIVED: <u> </u> YY/MM/DD 24 HR									
Reason Submitted: (F3 For Selection) <input type="checkbox"/>		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: <u> </u> System Number: <input type="checkbox"/>							
<input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst) <input type="checkbox"/> CHAIN OF CUSTODY <input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) <input type="checkbox"/> (Tracking Purposes)		AUTHORIZATION NUMBER: Sampling Site Identifier <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>							
ON-SITE ANALYTICAL RESULTS									
WATER TEMPERATURE °C	pH units	COLLECTION METHOD <input type="checkbox"/> GRAB <input type="checkbox"/> COMPOSITE							
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C,E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate									
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: <u> </u>									
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: <u> </u>									
MAIL REPORTS TO: ORIGINAL <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> COPY 1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> COPY 2 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>									
BASE SAMPLE NUMBER: <u>GL-970545</u>		Armstrong Lab PID: (AL Use Only) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>							
Date/Time Analysed:		Date/Time Analysed:							
GROUP A Holding Time		GROUP G Holding Time							
COD	28 Days	410.4	mg/L	Acidity, Total	14 Days	305.1			
Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total	14 Days	310.2			
Date/Time Analysed:						Alkalinity, Bicarbonate	14 Days	310.1	
GROUP B Holding Time							Bromide	28 Days	300.0
Oil & Grease	28 Days	413	mg/L	Chloride	28 Days	325.2/300.0			
TPH	28 Days	418.1	mg/L	Color	48 Hrs	110.2			
Date/Time Analysed:	<u>11/18/11</u>					Fluoride	28 Days	340.2/300.0	
GROUP C Holding Time		<u>98004500</u>					Residue, Total	7 Days	160.3
<input checked="" type="checkbox"/> Ammonia	28 Days	350.1	mg/L	Residue, Filterable	7 Days	160.1			
<input checked="" type="checkbox"/> Kjeldahl Nitrogen	28 Days	351.2	mg/L	Residue, Nonfilterable	7 Days	160.2			
<input checked="" type="checkbox"/> Nitrate + Nitrite	28 Days	353.2/300.0	mg/L	Residue, Settleable	48 Hrs	160.5			
Nitrate	48 Hrs	353.2/300.0	mg/L	Residue, Volatile	7 Days	160.4			
Nitrite	48 Hrs	353.2/300.0	mg/L	Silica	28 Days	370.1			
Orthophosphate	28 Days	365.1/300.0	mg/L	Specific Conductance	28 Days	120.1			
Phosphorus, Total	28 Days	365.1/300.0	mg/L	Sulfate	28 Days	375.2/300.0			
Date/Time Analysed:						Surfactants-MBAS	48 Hrs	425.1	
GROUP D Holding Time							Turbidity	48 Hrs	180.1
Cyanide, Total	14 Days	335.3	mg/L	Langlier Index	28 Days	203			
Cyanide, Free	14 Days	335.1	mg/L	Date/Time Analysed:					
Date/Time Analysed:						GROUP J Holding Time			
GROUP E Holding Time							Sulfides	7 Days	376.1
Phenols	28 Days	420.2	ug/L	CHEMIST: <u>BL</u>	mg/L				
Remarks: <u>% SOLID</u> <u>By weight: 0.7%</u>		APPROVED BY: <u>Mark</u>							

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM			AL/OEA USE ONLY	
DATE/TIME COLLECTED: <u>97/11/3</u> YY/MM/DD 24 HR			Mail Samples To: CHAIN OF CUSTODY Occupational & Environmental Health Directorate 2402 E. Drive., Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626	
DATE/TIME RECEIVED: <u>10/10/01</u> YY/MM/DD 24 HR				
Reason Submitted: <input type="checkbox"/> (F3 For Selection)			IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: <u>System Number:</u>	
<input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst) <input type="checkbox"/> CHAIN OF CUSTODY <input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) <input type="checkbox"/> (Tracking Purposes)			AUTHORIZATION NUMBER: Sampling Site Identifier	
ON-SITE ANALYTICAL RESULTS			BASE WHERE SAMPLE COLLECTED	
WATER TEMPERATURE °C	pH units	COLLECTION METHOD <input type="checkbox"/> GRAB <input type="checkbox"/> COMPOSITE	SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room)	
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C, E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate			SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN FAX	
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other:				
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other:			SIGNATURE	
MAIL REPORTS TO: <i>USE ASSIGNED BASE CODE</i>			6	
ORIGINAL COPY 1 COPY 2				
BASE SAMPLE NUMBER: <u>GL 970552</u>			Armstrong Lab PID: (AL Use Only)	
Date/Time Analysed:			Date/Time Analysed:	
GROUP A Holding Time			GROUP G Holding Time	
COD	28 Days	410.4	Acidity, Total	14 Days 305.1
Organic Carbon	28 Days	415.1	Alkalinity, Total	14 Days 310.2
Date/Time Analysed:			Alkalinity, Bicarbonate	14 Days 310.1
GROUP B Holding Time			Bromide	28 Days 300.0
Oil & Grease	28 Days	413	Chloride	28 Days 325.2/300.0
TPH	28 Days	418.1	Color	48 Hrs 110.2
Date/Time Analysed: <u>Sol 0</u>			Fluoride	28 Days 340.2/300.0
GROUP C Holding Time			Residue, Total	7 Days 160.3
<input checked="" type="checkbox"/> Ammonia N/8	28 Days	350.1	Residue, Filterable	7 Days 160.1
<input checked="" type="checkbox"/> Kjeldahl Nitrogen	28 Days	351.2	Residue, Nonfilterable	7 Days 160.2
<input checked="" type="checkbox"/> Nitrate + Nitrite N/10	28 Days	353.2/300.0	Residue, Settleable	48 Hrs 160.5
Nitrate	48 Hrs	353.2/300.0	Residue, Volatile	7 Days 160.4
Nitrite	48 Hrs	353.2/300.0	Silica	28 Days 370.1
Orthophosphate	28 Days	365.1/300.0	Specific Conductance	28 Days 120.1
Phosphorus, Total	28 Days	365.1/300.0	Sulfate	28 Days 375.2/300.0
Date/Time Analysed:			Surfactants-MBAS	48 Hrs 425.1
GROUP D Holding Time			Turbidity	48 Hrs 180.1
Cyanide, Total	14 Days	335.3	Langlier Index	28 Days 203
Cyanide, Free	14 Days	335.1	Date/Time Analysed:	
Date/Time Analysed:			GROUP J Holding Time	
GROUP E Holding Time			Sulfides	7 Days 376.1
Phenols	28 Days	420.2	CHEMIST: <u>Blm Dr</u>	
Remarks: <u>% Solids By Weight: 80.8%</u>			APPROVED BY:	
CHAIN OF CUSTODY				

INORGANIC ANALYSIS REQUEST FORM				AL/OEA	USE ONLY	CHAIN OF CUSTODY		
DATE/TIME COLLECTED:	97/11/3 YY/MM/DD			24 HR	Mail Samples To:	ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626		
DATE/TIME RECEIVED:	10/10/88 YY/MM/DD			24 HR				
Reason Submitted: (F3 For Selection)	IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name:			System Number:				
<input type="checkbox"/> ROUTINE	<input type="checkbox"/> PRIORITY (pre-arrange with analyst)			AUTHORIZATION NUMBER:				
<input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes)	<input type="checkbox"/> CHAIN OF CUSTODY (Tracking Purposes)			Sampling Site Identifier				
ON-SITE ANALYTICAL RESULTS					BASE WHERE SAMPLE COLLECTED			
WATER TEMPERATURE °C	pH units	COLLECTION, METHOD <input type="checkbox"/> GRAB <input type="checkbox"/> COMPOSITE			SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room			
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C, E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate					SAMPLE COLLECTED BY (NAME, GRADE, AFSC) <input type="checkbox"/> DSN <input type="checkbox"/> FAX			
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: _____					SIGNATURE			
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: _____								
MAIL REPORTS TO:		ORIGINAL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		COPY 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		COPY 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
BASE SAMPLE NUMBER:	GL-970559			Armstrong Lab PID: (AL Use Only)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Date/Time Analyzed:				Date/Time Analyzed:				
GROUP A Holding Time					GROUP G Holding Time			
COD	28 Days	410.4	mg/L	Acidity, Total	14 Days	305.1	mg/L	
Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total	14 Days	310.2	mg/L	
Date/Time Analyzed:				Alkalinity, Bicarbonate	14 Days	310.1	mg/L	
GROUP B Holding Time					Bromide	28 Days	300.0	mg/L
Oil & Grease	28 Days	413	mg/L	Chloride	28 Days	325.2/300.0	mg/L	
TPH	28 Days	418.1	mg/L	Color	48 Hrs	110.2	Units	
Date/Time Analyzed:	9800 FS 02 (14 Nov 97)			Fluoride	28 Days	340.2/300.0	mg/L	
GROUP C Holding Time					Residue, Total	7 Days	160.3	mg/L
Ammonia	28 Days	350.1	29.3 mg/L	Residue, Filterable	7 Days	160.1	mg/L	
Kjeldahl Nitrogen	28 Days	351.2	48 mg/L	Residue, Nonfilterable	7 Days	160.2	mg/L	
Nitrate + Nitrite	28 Days	353.2/300.0	50.1 mg/L	Residue, Settleable	48 Hrs	160.5	mg/L	
Nitrate	48 Hrs	353.2/300.0	mg/L	Residue, Volatile	7 Days	160.4	mg/L	
Nitrite	48 Hrs	353.2/300.0	mg/L	Silica	28 Days	370.1	mg/L	
Orthophosphate	28 Days	365.1/300.0	mg/L	Specific Conductance	28 Days	120.1	Umho	
Phosphorus, Total	28 Days	365.1/300.0	mg/L	Sulfate	28 Days	375.2/300.0	mg/L	
Date/Time Analyzed:				Surfactants-MBAS	48 Hrs	425.1	mg/L	
GROUP D Holding Time					Turbidity	48 Hrs	180.1	Units
Cyanide, Total	14 Days	335.3	mg/L	Langlier Index	28 Days	203		
Cyanide, Free	14 Days	335.1	mg/L	Date/Time Analyzed:				
Date/Time Analyzed:				GROUP J Holding Time				
GROUP E Holding Time					Sulfides	7 Days	376.1	mg/L
Phenols	28 Days	420.2	11/18/97 ug/L	CHEMIST: <i>B. L. Jones</i>				
Remarks: <i>100% SOLID BY WEIGHT ± 2.6% CHAIN OF CUSTODY</i>				APPROVED BY: <i>Mark J. O'Brien</i>				

INORGANIC ANALYSIS REQUEST FORM			AL/OEA U.S. AIR FORCE ONLY	CHAIN OF CUSTODY			
DATE/TIME COLLECTED: <u>97/11/3</u>		YY/MM/DD	24 HR	Mail Samples To: <u>10100</u>			
DATE/TIME RECEIVED: _____		YY/MM/DD	24 HR	ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626			
Reason Submitted: <input type="checkbox"/> (F3 For Selection)		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: _____					
<input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst)		AUTHORIZATION NUMBER: _____					
<input type="checkbox"/> CHAIN OF CUSTODY <input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) <input type="checkbox"/> (Tracking Purposes)		Sampling Site Identifier: _____					
ON-SITE ANALYTICAL RESULTS							
WATER TEMPERATURE °C	pH units	COLLECTION METHOD <input type="checkbox"/> GRAB <input type="checkbox"/> COMPOSITE					
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C,E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate							
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: _____							
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: _____							
MAIL REPORTS TO: <i>(USE ASSIGNED BASE CODE)</i>		ORIGINAL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		COPY 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		COPY 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
BASE SAMPLE NUMBER: <u>GL-970566</u>		ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114					
Date/Time Analysed:		Armstrong Lab PID: (AL Use Only) _____					
GROUP A Holding Time		Date/Time Analysed:					
COD	28 Days	410.4	mg/L	GROUP G Holding Time			
Organic Carbon	28 Days	415.1	mg/L	Acidity, Total	14 Days 305.1 mg/L		
Date/Time Analysed:					Alkalinity, Total	14 Days 310.2 mg/L	
GROUP B Holding Time						Alkalinity, Bicarbonate	14 Days 310.1 mg/L
Oil & Grease	28 Days	413	mg/L	Bromide	28 Days 300.0 mg/L		
TPH	28 Days	418.1	mg/L	Chloride	28 Days 325.2/300.0 mg/L		
Date/Time Analysed:	<u>Soil</u> <u>14AB97</u>				Color	48 Hrs 110.2 Units	
GROUP C Holding Time		<u>98104503</u>				Fluoride	28 Days 340.2/300.0 mg/L
<input checked="" type="checkbox"/> Ammonia	<u>11/18</u> 28 Days	350.1	<u><0.001</u> mg/L	Residue, Total	7 Days 160.3 mg/L		
<input checked="" type="checkbox"/> Kjeldahl Nitrogen	28 Days	351.2	<u>AB97 6.66</u> mg/L	Residue, Filterable	7 Days 160.1 mg/L		
<input checked="" type="checkbox"/> Nitrate + Nitrite	<u>11/20</u> 28 Days	353.2/300.0	<u>.02</u> mg/L	Residue, Nonfilterable	7 Days 160.2 mg/L		
Nitrate	48 Hrs	353.2/300.0	mg/L	Residue, Settleable	48 Hrs 160.5 mg/L		
Nitrite	48 Hrs	353.2/300.0	mg/L	Residue, Volatile	7 Days 160.4 mg/L		
Orthophosphate	28 Days	365.1/300.0	mg/L	Silica	28 Days 370.1 mg/L		
Phosphorus, Total	28 Days	365.1/300.0	mg/L	Specific Conductance	28 Days 120.1 Umho		
Date/Time Analysed:					Sulfate	28 Days 375.2/300.0 mg/L	
GROUP D Holding Time						Surfactants-MBAS	48 Hrs 425.1 mg/L
Cyanide, Total	14 Days	335.3	mg/L	Turbidity	48 Hrs 180.1 Units		
Cyanide, Free	14 Days	335.1	mg/L	Langlier Index	28 Days 203		
Date/Time Analysed:					Date/Time Analysed:		
GROUP E Holding Time						GROUP J Holding Time	
Phenols	28 Days	420.2	ug/L	Sulfides	7 Days 376.1 mg/L		
Remarks: <u>70 SOLID</u> <u>11/18/97</u> <u>Weight: 66.8%</u>					CHEMIST: <u>Blair</u>		
						APPROVED BY: <u>W. Parker Ode</u>	

INORGANIC ANALYSIS REQUEST FORM

CHAIN OF CUSTODY

DATE/TIME COLLECTED: 97/11/3
YY/MM/DD 24 HRDATE/TIME RECEIVED:
YY/MM/DD 24 HRAL/OC/EA
USE
ONLYMail Samples To: **ARMSTRONG LABORATORY**
Occupational & Environmental Health Directorate
2402 E. Drive, Bldg 140
Brooks AFB, Texas 78235-5114
DSN: 240-3626 (210) 536-3626Reason Submitted:
(F3 For Selection)IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?
System Name:
System Number: ROUTINE
 CHAIN OF CUSTODY
(Litigation Purposes) PRIORITY (pre-arrange with analyst)
 CHAIN OF CUSTODY
(Tracking Purposes)

AUTHORIZATION NUMBER:

Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE °C pH units COLLECTION METHOD
 GRAB COMPOSITE

BASE WHERE SAMPLE COLLECTED

HOW WAS THE SAMPLE PRESERVED? Group A-C, E:Sulfuric Acid
 Group D:Sodium Hydroxide Group G:None Group J:Zinc Acetate

SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room)

SAMPLE LOCATION:

 Source Pt of Entry Distribution Other:

SAMPLE COLLECTED BY (NAME, GRADE, AFSC)

DSN
FAX

WATER TREATMENT:

 Raw Chlorination Fluoridation Other:

SIGNATURE

MAIL REPORTS TO:

ORIGINAL

(USE ASSIGNED BASE CODE)

COPY 1

COPY 2

BASE SAMPLE
NUMBER:GL970573Armstrong Lab PID:
(AL Use Only)

DEGREES CELSIUS

Date/Time
Analyzed:

GROUP A Holding Time

Date/Time
Analyzed:

GROUP G Holding Time

COD 28 Days 410.4 mg/L
Organic Carbon 28 Days 415.1 mg/L

Acidity, Total 14 Days 305.1 mg/L

Oil & Grease 28 Days 413 mg/L
TPH 28 Days 418.1 mg/L

Alkalinity, Total 14 Days 310.2 mg/L

Date/Time
Analyzed:

Alkalinity, Bicarbonate 14 Days 310.1 mg/L

GROUP B Holding Time

Bromide 28 Days 300.0 mg/L

Residue, Total 7 Days 160.3 mg/L

Chloride 28 Days 325.2/300.0 mg/L

Color 48 Hrs 110.2 Units

Color 48 Hrs 110.2 Units

Fluoride 28 Days 340.2/300.0 mg/L

Fluoride 28 Days 340.2/300.0 mg/L

Residue, Filterable 7 Days 160.1 mg/L

Residue, Filterable 7 Days 160.1 mg/L

Residue, Nonfilterable 7 Days 160.2 mg/L

Residue, Nonfilterable 7 Days 160.2 mg/L

Residue, Settleable 48 Hrs 160.5 mg/L

Residue, Settleable 48 Hrs 160.5 mg/L

Residue, Volatile 7 Days 160.4 mg/L

Residue, Volatile 7 Days 160.4 mg/L

Silica 28 Days 370.1 mg/L

Silica 28 Days 370.1 mg/L

Specific Conductance 28 Days 120.1 Umho

Specific Conductance 28 Days 120.1 Umho

Sulfate 28 Days 375.2/300.0 mg/L

Sulfate 28 Days 375.2/300.0 mg/L

Surfactants-MBAS 48 Hrs 425.1 mg/L

Surfactants-MBAS 48 Hrs 425.1 mg/L

Turbidity 48 Hrs 180.1 Units

Turbidity 48 Hrs 180.1 Units

Langlier Index 28 Days 203

Langlier Index 28 Days 203

Date/Time
Analyzed:

GROUP D Holding Time

Data/Time
Analyzed:

Cyanide, Total 14 Days 335.3 mg/L

Cyanide, Total 14 Days 335.3 mg/L

Cyanide, Free 14 Days 335.1 mg/L

Cyanide, Free 14 Days 335.1 mg/L

Date/Time
Analyzed:

GROUP E Holding Time

GROUP J Holding Time

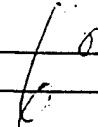
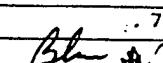
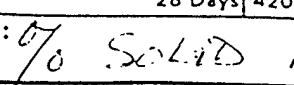
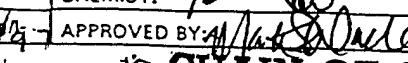
Phenols 28 Days 420.2 mg/L

Sulfides 7 Days 376.1 mg/L

11/18/97 mg/L

CHEMIST: Bl APPROVED BY: Mark P. O'DellRemarks: 70% SOLID BY WEIGHT: 8.9%

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM			AL/OFAC MAIL ONLY	CHAIN OF CUSTODY	
DATE/TIME COLLECTED:	97/11/3 YY/MM/DD		Mail Samples To:	ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626	
DATE/TIME RECEIVED:	YY/MM/DD		24 HR	10/10/00	
Reason Submitted: (F3 For Selection)	IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: <input type="text"/>				
<input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst)	AUTHORIZATION NUMBER: <input type="text"/>				
<input type="checkbox"/> CHAIN OF CUSTODY <input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) <input type="checkbox"/> (Tracking Purposes)	Sampling Site Identifier <input type="text"/> <input type="checkbox"/>				
ON-SITE ANALYTICAL RESULTS					
WATER TEMPERATURE °C	pH units	COLLECTION METHOD <input type="checkbox"/> GRAB <input type="checkbox"/> COMPOSITE	BASE WHERE SAMPLE COLLECTED		
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C, E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate			SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room		
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: _____			SAMPLE COLLECTED BY (NAME, GRADE, AFSGI, DSN) ROCCO, FAX: 713-474-1100		
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: _____			SIGNATURE 		
MAIL REPORTS TO:	ORIGINAL	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>			
COPY 1 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>					
COPY 2 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>					
BASE SAMPLE NUMBER:	GL97058(1)		Armstrong Lab PID: (AL Use Only) <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	DEGREES/IDE	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Date/Time Analysed:			Date/Time Analysed:		
GROUP A Holding Time			GROUP G Holding Time		
COD	28 Days	410.4	mg/L	Acidity, Total	14 Days 305.1
Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total	14 Days 310.2
Date/Time Analysed:			Date/Time Analysed:		
GROUP B Holding Time			GROUP H Holding Time		
Oil & Grease	28 Days	413	mg/L	Bromide	28 Days 300.0
TPH	28 Days	418.1	mg/L	Chloride	28 Days 325.2/300.0
Date/Time Analysed:			Date/Time Analysed:		
GROUP C Holding Time			GROUP I Holding Time		
Ammonia	11/18	28 Days 350.1	mg/L	Color	48 Hrs 110.2
Kjeldahl Nitrogen	28 Days	351.2	mg/L	Fluoride	28 Days 340.2/300.0
Nitrate + Nitrite	11/20	28 Days 353.2/300.0	mg/L	Residue, Total	7 Days 160.3
Nitrate	48 Hrs	353.2/300.0	mg/L	Residue, Filterable	7 Days 160.1
Nitrite	48 Hrs	353.2/300.0	mg/L	Residue, Nonfilterable	7 Days 160.2
Orthophosphate	28 Days	365.1/300.0	mg/L	Residue, Settleable	48 Hrs 160.5
Phosphorus, Total	28 Days	365.1/300.0	mg/L	Residue, Volatile	7 Days 160.4
Date/Time Analysed:			Date/Time Analysed:		
GROUP D Holding Time			GROUP J Holding Time		
Cyanide, Total	14 Days	335.3	mg/L	Silica	28 Days 370.1
Cyanide, Free	14 Days	335.1	mg/L	Specific Conductance	28 Days 120.1
Date/Time Analysed:			Date/Time Analysed:		
GROUP E Holding Time			CHEMIST: 		
Phenols	28 Days	420.2	mg/L	Sulfides	7 Days 376.1
Remarks: 0% Solid By Weight: 51.2%  CHAIN OF CUSTODY	APPROVED BY: 				

INORGANIC ANALYSIS REQUEST FORM			AL/OF/EA ONLY	CHAIN OF CUSTODY		
DATE/TIME COLLECTED: <u>97/11/4</u> YY/MM/DD 24 HR		Mail Samples To: <u>10100</u>		ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626		
DATE/TIME RECEIVED: <u> </u> YY/MM/DD 24 HR		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: <u> </u> System Number: <u> </u>				
<input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst) <input type="checkbox"/> CHAIN OF CUSTODY <input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) (Tracking Purposes)		AUTHORIZATION NUMBER: <u> </u>				
		Sampling Site Identifier				
ON-SITE ANALYTICAL RESULTS						
WATER TEMPERATURE °C	pH units	COLLECTION METHOD		BASE WHERE SAMPLE COLLECTED		
		<input type="checkbox"/> GRAB	<input type="checkbox"/> COMPOSITE			
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C,E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate						
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: <u> </u>						
SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN <input type="checkbox"/> FAX						
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: <u> </u>						
SIGNATURE <u> </u>						
MAIL REPORTS TO:		ORIGINAL				
<i>(USE ASSIGNED BASE CODE)</i>		COPY 1				
		COPY 2				
BASE SAMPLE NUMBER: <u>GLC170587</u>		DEGREES CELSIUS				
Date/Time Analyzed:						
GROUP A Holding Time		GROUP G Holding Time				
COD	28 Days	410.4	mg/L	Acidity, Total	14 Days	305.1
Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total	14 Days	310.2
Date/Time Analyzed:				Alkalinity, Bicarbonate	14 Days	310.1
GROUP B Holding Time						
Oil & Grease	28 Days	413	mg/L	Bromide	28 Days	300.0
TPH	28 Days	418.1	mg/L	Chloride	28 Days	325.2/300.0
Date/Time Analyzed:				Color	48 Hrs	110.2
GROUP C Holding Time		<u>14 Nov 97</u>				
Ammonia	28 Days	350.1	5.5	Fluoride	28 Days	340.2/300.0
Kjeldahl Nitrogen	28 Days	351.2	84	Residue, Total	7 Days	160.3
Nitrate + Nitrite	28 Days	353.2/300.0	0.1	Residue, Filterable	7 Days	160.1
Nitrate	48 Hrs	353.2/300.0	mg/L	Residue, Nonfilterable	7 Days	160.2
Nitrite	48 Hrs	353.2/300.0	mg/L	Residue, Settleable	48 Hrs	160.5
Orthophosphate	28 Days	365.1/300.0	mg/L	Residue, Volatile	7 Days	160.4
Phosphorus, Total	28 Days	365.1/300.0	mg/L	Silica	28 Days	370.1
Date/Time Analyzed:				Specific Conductance	28 Days	120.1
GROUP D Holding Time						
Cyanide, Total	14 Days	335.3	mg/L	Sulfate	28 Days	375.2/300.0
Cyanide, Free	14 Days	335.1	mg/L	Surfactants-MBAS	48 Hrs	425.1
Date/Time Analyzed:				Turbidity	48 Hrs	180.1
GROUP E Holding Time						
Phenols	28 Days	420.2	ug/L	Langlier Index	28 Days	203
Remarks: <u>0% Solid By weight, 0.4%</u>						APPROVED BY: <u>Mark Davis</u>

INORGANIC ANALYSIS REQUEST FORM

CH-100A
USE
ONLY

CHAIN OF CUSTODY

DATE/TIME COLLECTED: 97/11/4
YY/MM/DD 24 HRMail Samples To: **ARMSTRONG LABORATORY**
Occupational & Environmental Health Directorate
2402 E. Drive, Bldg 140
Brooks AFB, Texas 78235-5114DATE/TIME RECEIVED: 10/10/87
YY/MM/DD 24 HR

DSN: 240-3626 (210) 536-3626

Reason Submitted: (F3 For Selection) IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?
System Name: System Number: ROUTINE PRIORITY (pre-arrange with analyst)
 CHAIN OF CUSTODY CHAIN OF CUSTODY
(Litigation Purposes) (Tracking Purposes)

AUTHORIZATION NUMBER:

Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE 0 °C pH 7 UNITS COLLECTION METHOD GRAB COMPOSITE

BASE WHERE SAMPLE COLLECTED

HOW WAS THE SAMPLE PRESERVED? Group A-C,E:Sulfuric Acid
 Group D:Sodium Hydroxide Group G:None Group J:Zinc Acetate

SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room

SAMPLE LOCATION:

 Source Pt of Entry Distribution Other: _____SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN
FAX

WATER TREATMENT:

 Raw Chlorination Fluoridation Other: _____

SIGNATURE

MAIL REPORTS TO:

ORIGINAL

(USE ASSIGNED BASE CODE)

COPY 1

COPY 2

BASE SAMPLE
NUMBER:G-1-970595Armstrong Lab PID:
(AL Use Only)Date/Time
Analysed:Date/Time
Analysed:

GROUP A Holding Time

GROUP G Holding Time

COD	28 Days	410.4	mg/L	Acidity, Total	14 Days	305.1	mg/L
Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total	14 Days	310.2	mg/L

Alkalinity, Bicarbonate	14 Days	310.1	mg/L
Bromide	28 Days	300.0	mg/L
Chloride	28 Days	325.2/300.0	mg/L

Color	48 Hrs	110.2	Units
Fluoride	28 Days	340.2/300.0	mg/L
Residue, Total	7 Days	160.3	mg/L

Residue, Filterable	7 Days	160.1	mg/L
Residue, Nonfilterable	7 Days	160.2	mg/L
Residue, Settleable	48 Hrs	160.5	ml/L

Residue, Volatile	7 Days	160.4	mg/L
Silica	28 Days	370.1	mg/L
Specific Conductance	28 Days	120.1	Umho

Sulfate	28 Days	375.2/300.0	mg/L
Surfactants-MBAS	48 Hrs	425.1	mg/L
Turbidity	48 Hrs	180.1	Units

Langlier Index	28 Days	203	
----------------	---------	-----	--

Date/Time Analysed:				Date/Time Analysed:			
------------------------	--	--	--	------------------------	--	--	--

GROUP D Holding Time

Cyanide, Total	14 Days	335.3	mg/L				
Cyanide, Free	14 Days	335.1	mg/L				

Date/Time Analysed:				Date/Time Analysed:			
------------------------	--	--	--	------------------------	--	--	--

GROUP E Holding Time

GROUP J Holding Time				
----------------------	--	--	--	--

Phenols	28 Days	420.2	ug/L	Sulfides	7 Days	376.1	mg/L
---------	---------	-------	------	----------	--------	-------	------

Remarks: <u>07/18/87</u> Solid <u>11/13/87</u> By Weight: 65.9% <u>CHAIN OF CUSTODY</u>	CHEMIST: <u>Blair</u>			
---	-----------------------	--	--	--

APPROVED BY: <u>Mark Ode</u>				
------------------------------	--	--	--	--

INORGANIC ANALYSIS REQUEST FORM				AL/OEA USE CLIA CHAIN OF CUSTODY		
DATE/TIME COLLECTED: <u>97/11/4</u>		YY/MM/DD	24 HR	Mail Samples To: <u>10/00</u>		ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626
DATE/TIME RECEIVED: _____		YY/MM/DD	24 HR			
Reason Submitted: (F3 For Selection) <input type="checkbox"/>		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: _____				
<input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst)		AUTHORIZATION NUMBER: _____				
<input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) <input type="checkbox"/> CHAIN OF CUSTODY (Tracking Purposes)		Sampling Site Identifier: _____				
ON-SITE ANALYTICAL RESULTS						
WATER TEMPERATURE °C	pH units	COLLECTION METHOD <input type="checkbox"/> GRAB <input type="checkbox"/> COMPOSITE				
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C,E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate						
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: _____						
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: _____						
SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN: <u>100000000000</u> FAX: <u>1111111111</u>						
MAIL REPORTS TO: ORIGINAL <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> COPY 1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> COPY 2 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						
BASE SAMPLE NUMBER: <u>GL-970601</u>		Armstrong Lab PID: (AL Use Only) <input type="checkbox"/>				
Date/Time Analyzed: _____		Date/Time Analyzed: _____				
GROUP A Holding Time		GROUP G Holding Time				
COD	28 Days	410.4	mg/L	Acidity, Total	14 Days	305.1
Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total	14 Days	310.2
Date/Time Analyzed: _____		Alkalinity, Bicarbonate 14 Days 310.1				
GROUP B Holding Time		Bromide 28 Days 300.0				
Oil & Grease	28 Days	413	mg/L	Chloride	28 Days	325.2/300.0
TPH	28 Days	418.1	mg/L	Color	48 Hrs	110.2
Date/Time Analyzed: _____		Fluoride 28 Days 340.2/300.0				
GROUP C Holding Time		Residue, Total 7 Days 160.3				
Ammonia	11/18	28 Days	350.1	Residue, Filterable	7 Days	160.1
Kjeldahl Nitrogen	28 Days	351.2	mg/L	Residue, Nonfilterable	7 Days	160.2
Nitrate + Nitrite	28 Days	353.2/300.0	mg/L	Residue, Settleable	48 Hrs	160.5
Nitrate	48 Hrs	353.2/300.0	mg/L	Residue, Volatile	7 Days	160.4
Nitrite	48 Hrs	353.2/300.0	mg/L	Silica	28 Days	370.1
Orthophosphate	28 Days	365.1/300.0	mg/L	Specific Conductance	28 Days	120.1
Phosphorus, Total	28 Days	365.1/300.0	mg/L	Sulfate	28 Days	375.2/300.0
Date/Time Analyzed: _____		Surfactants-MBAS 48 Hrs 425.1				
GROUP D Holding Time		Turbidity 48 Hrs 180.1				
Cyanide, Total	14 Days	335.3	mg/L	Langlier Index	28 Days	203
Cyanide, Free	14 Days	335.1	mg/L	Data/Time Analyzed: _____		
Date/Time Analyzed: _____		GROUP J Holding Time				
GROUP E Holding Time		Sulfides 7 Days 376.1				
Phenols	28 Days	420.2	ug/L	CHEMIST: <u>Bob</u>		
Remarks: <u>90% SOLID BY WEIGHT, 2.9%</u>		APPROVED BY: <u>Mark Steele</u>				

INORGANIC ANALYSIS REQUEST FORM			AL/OEA USE						
			CHAIN OF CUSTODY						
DATE/TIME COLLECTED:	97/11/4 YY/MM/DD		Mail Samples To:	ARMSTRONG LABORATORY Occupational & Environmental Health Directorate					
DATE/TIME RECEIVED:	10/00 YY/MM/DD		24 HR						
Reason Submitted: (F3 For Selection)	IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: <input type="text"/>								
<input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst)		AUTHORIZATION NUMBER:							
<input type="checkbox"/> CHAIN OF CUSTODY <input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) <input type="checkbox"/> (Tracking Purposes)		Sampling Site Identifier							
ON-SITE ANALYTICAL RESULTS									
WATER TEMPERATURE °C	pH units	COLLECTION METHOD <input type="checkbox"/> GRAB <input type="checkbox"/> COMPOSITE							
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C,E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate									
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: _____									
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: _____									
SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN FAX									
SIGNATURE									
MAIL REPORTS TO: <small>(USE ASSIGNED BASE CODE)</small>		ORIGINAL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
		COPY 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
		COPY 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
BASE SAMPLE NUMBER:		6L970608							
Date/Time Analysed:		Armstrong Lab PID: (AL Use Only)							
GROUP A Holding Time		Date/Time Analysed:							
COD	28 Days	410.4	mg/L	Acidity, Total	14 Days	305.1	mg/L		
Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total	14 Days	310.2	mg/L		
Date/Time Analysed:					Alkalinity, Bicarbonate	14 Days	310.1	mg/L	
GROUP B Holding Time						Bromide	28 Days	300.0	mg/L
Oil & Grease	28 Days	413	mg/L	Chloride	28 Days	325.2/300.0	mg/L		
TPH	28 Days	418.1	mg/L	Color	48 Hrs	110.2	Units		
Date/Time Analysed:	Sludge				Fluoride	28 Days	340.2/300.0	mg/L	
GROUP C Holding Time		14 Nov 98004509				Residue, Total	7 Days	160.3	mg/L
Ammonia	11/18	28 Days	350.1	0.15	Residue, Filterable	7 Days	160.1	mg/L	
Kjeldahl Nitrogen	28 Days	351.2	0.32	Residue, Nonfilterable	7 Days	160.2	mg/L		
Nitrate + Nitrite	11/18	28 Days	353.2/300.0	No mg/L	Residue, Settleable	48 Hrs	160.5	ml/L	
Nitrate	48 Hrs	353.2/300.0	0.026	Residue, Volatile	7 Days	160.4	mg/L		
Nitrite	48 Hrs	353.2/300.0	mg/L	Silica	28 Days	370.1	mg/L		
Orthophosphate	28 Days	365.1/300.0	mg/L	Specific Conductance	28 Days	120.1	Umho:		
Phosphorus, Total	28 Days	365.1/300.0	mg/L	Sulfate	28 Days	375.2/300.0	mg/L		
Date/Time Analysed:					Surfactants-MBAS	48 Hrs	425.1	mg/L	
GROUP D Holding Time						Turbidity	48 Hrs	180.1	Units
Cyanide, Total	14 Days	335.3	mg/L	Langlier Index	28 Days	203			
Cyanide, Free	14 Days	335.1	mg/L	Date/Time Analysed:					
Date/Time Analysed:					GROUP J Holding Time				
GROUP E Holding Time						Sulfides	7 Days	376.1	mg/L
Phenols	28 Days	420.2	ug/L	CHEMIST:	Blair				
Remarks:	11/20/97 % SOLID By Weight 48.7%				APPROVED BY:	Mark Dade			

INORGANIC ANALYSIS REQUEST FORM			AL/OEA USE			
DATE/TIME COLLECTED:	9-7-11-14 YY/MM/DD 24 HR		Mail Samples To:	ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626 10/10		
DATE/TIME RECEIVED:	YY/MM/DD 24 HR					
Reason Submitted: (F3 For Selection)	IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name:		System Number:			
<input type="checkbox"/> ROUTINE	<input type="checkbox"/> PRIORITY (pre-arrange with analyst)		AUTHORIZATION NUMBER:			
<input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes)	<input type="checkbox"/> CHAIN OF CUSTODY (Tracking Purposes)		Sampling Site Identifier			
ON-SITE ANALYTICAL RESULTS						
WATER TEMPERATURE °C	pH units	COLLECTION METHOD □ GRAB □ COMPOSITE	BASE WHERE SAMPLE COLLECTED			
HOW WAS THE SAMPLE PRESERVED? □ Group A-C, E:Sulfuric Acid □ Group D:Sodium Hydroxide □ Group G:None □ Group J:Zinc Acetate						
SAMPLE LOCATION: □ Source □ Pt of Entry □ Distribution □ Other: _____						
SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN FAX						
WATER TREATMENT: □ Raw □ Chlorination □ Fluoridation □ Other: _____						
SIGNATURE						
MAIL REPORTS TO:		ORIGINAL				
USE ASSIGNED BASE CODE:		COPY 1				
		COPY 2				
BASE SAMPLE NUMBER:	G, 970615		Armstrong Lab PID:			
Date/Time Analysed:			Date/Time Analysed:	DEGREES CELSIUS		
GROUP A Holding Time		GROUP G Holding Time				
COD	28 Days	410.4	mg/L	Acidity, Total	14 Days 305.1	mg/L
Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total	14 Days 310.2	mg/L
Date/Time Analysed:			Date/Time Analysed:	DEGREES CELSIUS		
GROUP B Holding Time		GROUP G Holding Time				
Oil & Grease	28 Days	413	mg/L	Bromide	28 Days 300.0	mg/L
TPH	28 Days	418.1	mg/L	Chloride	28 Days 325.2/300.0	mg/L
Date/Time Analysed:			Date/Time Analysed:	DEGREES CELSIUS		
GROUP C Holding Time		GROUP G Holding Time				
Ammonia	11/18	350.1	26.3 mg/L	Color	48 Hrs 110.2	Units
Kjeldahl Nitrogen	28 Days	351.2	40 mg/L	Fluoride	28 Days 340.2/300.0	mg/L
Nitrate + Nitrite	28 Days	353.2/300.0	50.1 mg/L	Residue, Total	7 Days 160.3	mg/L
Nitrate	48 Hrs	353.2/300.0	mg/L	Residue, Filterable	7 Days 160.1	mg/L
Nitrite	48 Hrs	353.2/300.0	mg/L	Residue, Nonfilterable	7 Days 160.2	mg/L
Orthophosphate	28 Days	365.1/300.0	mg/L	Residue, Settleable	48 Hrs 160.5	ml/L
Phosphorus, Total	28 Days	365.1/300.0	mg/L	Residue, Volatile	7 Days 160.4	mg/L
Date/Time Analysed:			Date/Time Analysed:	DEGREES CELSIUS		
GROUP D Holding Time		GROUP G Holding Time				
Cyanide, Total	14 Days	335.3	mg/L	Silica	28 Days 370.1	mg/L
Cyanide, Free	14 Days	335.1	mg/L	Specific Conductance	28 Days 120.1	Umho
Date/Time Analysed:			Date/Time Analysed:	DEGREES CELSIUS		
GROUP E Holding Time		GROUP G Holding Time				
Phenols	28 Days	420.2	11/18 ug/L	Sulfate	28 Days 375.2/300.0	mg/L
Remarks: 0% Solid By Weight 0.9%			Date/Time Analysed:	DEGREES CELSIUS		
APPROVED BY: M. A. DeLoach						
PREVIOUS EDITION IS OBSOLETE						

INORGANIC ANALYSIS REQUEST FORM				AL/OEA ONE ONLY	CHAIN OF CUSTODY	
DATE/TIME COLLECTED: <u>97/11/4</u> YY/MM/DD 24 HR				Mail Samples To: ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626		
DATE/TIME RECEIVED: <u>10/10/00</u> YY/MM/DD 24 HR						
Reason Submitted: (F3 For Selection) <input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst) <input type="checkbox"/> CHAIN OF CUSTODY <input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) <input type="checkbox"/> (Tracking Purposes)				IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: <u>System Number:</u>		
				AUTHORIZATION NUMBER: Sampling Site Identifier		
				BASE WHERE SAMPLE COLLECTED		
				SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room)		
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C,E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate				SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN FAX		
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: _____						
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: _____				SIGNATURE		
MAIL REPORTS TO: <i>(USE ASSIGNED BASE CODE)</i>				ORIGINAL		
				COPY 1		
				COPY 2		
BASE SAMPLE NUMBER:		<u>GL 970622</u>		Armstrong Lab PID: (AL Use Only)		
Date/Time Analysed:				Date/Time Analysed:		
GROUP A Holding Time				GROUP G Holding Time		
COD 28 Days 410.4 mg/L				Acidity, Total 14 Days 305.1 mg/L		
Organic Carbon 28 Days 415.1 mg/L				Alkalinity, Total 14 Days 310.2 mg/L		
Date/Time Analysed:				Alkalinity, Bicarbonate 14 Days 310.1 mg/L		
GROUP B Holding Time				Bromide 28 Days 300.0 mg/L		
Oil & Grease 28 Days 413 mg/L				Chloride 28 Days 325.2/300.0 mg/L		
TPH 28 Days 418.1 mg/L				Color 48 Hrs 110.2 Units		
Date/Time Analysed: <u>Soil</u>		<u>9800 4/5/11</u>		Fluoride 28 Days 340.2/300.0 mg/L		
GROUP C Holding Time				Residue, Total 7 Days 160.3 mg/L		
Ammonia 1/18 28 Days 350.1 <0.004 mg/L				Residue, Filterable 7 Days 160.1 mg/L		
Kjeldahl Nitrogen 28 Days 351.2 0.04 3.2 mg/g				Residue, Nonfilterable 7 Days 160.2 mg/L		
Nitrate + Nitrite 1/20 28 Days 353.2/300.0 0.005 mg/L				Residue, Settleable 48 Hrs 160.5 mg/L		
Nitrate 48 Hrs 353.2/300.0 mg/L				Residue, Volatile 7 Days 160.4 mg/L		
Nitrite 48 Hrs 353.2/300.0 mg/L				Silica 28 Days 370.1 mg/L		
Orthophosphate 28 Days 365.1/300.0 mg/L				Specific Conductance 28 Days 120.1 Units		
Phosphorus, Total 28 Days 365.1/300.0 mg/L				Sulfate 28 Days 375.2/300.0 mg/L		
Date/Time Analysed:				Surfactants-MBAS 48 Hrs 425.1 mg/L		
GROUP D Holding Time				Turbidity 48 Hrs 180.1 Units		
Cyanide, Total 14 Days 335.3 mg/L				Langlier Index 28 Days 203		
Cyanide, Free 14 Days 335.1 mg/L				Date/Time Analysed:		
Date/Time Analysed:				GROUP J Holding Time		
GROUP E Holding Time				Sulfides 7 Days 376.1 mg/L		
Phenols 28 Days 420.2 ug/L				CHEMIST: <u>BL</u>		
Remarks: <u>% Solid By Weight: 83.2%</u>				APPROVED BY: <u>W. Parker, Lab. Dir.</u>		

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM			AL/OEA USE ONLY		
DATE/TIME COLLECTED: <u>97/11/4</u> YY/MM/DD		24 HR	Mail Samples To: ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive., Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626		
DATE/TIME RECEIVED: _____ YY/MM/DD		24 HR	<u>10/10/8</u>		
Reason Submitted: (F3 For Selection)		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: _____ System Number: _____			
<input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst)		AUTHORIZATION NUMBER: _____			
<input type="checkbox"/> CHAIN OF CUSTODY <input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) (Tracking Purposes)		Sampling Site Identifier: _____			
ON-SITE ANALYTICAL RESULTS					
WATER TEMPERATURE °C	pH units	COLLECTION METHOD <input type="checkbox"/> GRAB <input type="checkbox"/> COMPOSITE	BASE WHERE SAMPLE COLLECTED		
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C, E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate					
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: _____					
SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN FAX					
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: _____					
SIGNATURE: <u>G</u>					
MAIL REPORTS TO: <i>(Use Assigned Base Code)</i>		ORIGINAL COPY 1 COPY 2	DEGREES CELSIUS		
BASE SAMPLE NUMBER: <u>GL970629</u>		Armstrong Lab PID: (AL Use Only) _____			
Date/Time Analysed: _____		Date/Time Analysed: _____			
GROUP A Holding Time		GROUP G Holding Time			
COD	28 Days	410.4	mg/L	Acidity, Total 14 Days 305.1 mg/L	
Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total 14 Days 310.2 mg/L	
Date/Time Analysed: _____				Alkalinity, Bicarbonate 14 Days 310.1 mg/L	
GROUP B Holding Time		Bromide 28 Days 300.0 mg/L			
Oil & Grease	28 Days	413	mg/L	Chloride 28 Days 325.2/300.0 mg/L	
TPH	28 Days	418.1	mg/L	Color 48 Hrs 110.2 Units	
Date/Time Analysed: _____	<u>98/10/4/12</u>			Fluoride 28 Days 340.2/300.0 mg/L	
GROUP C Holding Time		Residue, Total 7 Days 160.3 mg/L			
Ammonia	28 Days	350.1	52.5 mg/L	Residue, Filterable 7 Days 160.1 mg/L	
Kjeldahl Nitrogen	28 Days	351.2	64 mg/L	Residue, Nonfilterable 7 Days 160.2 mg/L	
Date/Time Analysed: _____				Residue, Settleable 48 Hrs 160.5 ml/L	
Nitrate + Nitrite	28 Days	353.2/300.0	50.1 mg/L	Residue, Volatile 7 Days 160.4 mg/L	
Nitrate	48 Hrs	353.2/300.0	mg/L	Silica 28 Days 370.1 mg/L	
Nitrite	48 Hrs	353.2/300.0	mg/L	Specific Conductance 28 Days 120.1 Umho	
Orthophosphate	28 Days	365.1/300.0	mg/L	Sulfate 28 Days 375.2/300.0 mg/L	
Phosphorus, Total	28 Days	365.1/300.0	mg/L	Surfactants-MBAS 48 Hrs 425.1 mg/L	
Date/Time Analysed: _____				Turbidity 48 Hrs 180.1 Units	
GROUP D Holding Time		Langlier Index 28 Days 203			
Cyanide, Total	14 Days	335.3	mg/L	Date/Time Analysed: _____	
Cyanide, Free	14 Days	335.1	mg/L	GROUP J Holding Time	
Date/Time Analysed: _____				Sulfides 7 Days 376.1 mg/L	
GROUP E Holding Time		CHEMIST: <u>BL</u>			
Phenols	28 Days	420.2	111.6/67 mg/L	APPROVED BY: <u>Wade S. D.</u>	
Remarks: <u>1/2 Solid By Weight: 10.2%</u>					

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM			AL/OEA USE ONLY						
DATE/TIME COLLECTED: <u>97/11/4</u> YY/MM/DD 24 HR		Mail Samples To: ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626 <u>10/08</u>							
DATE/TIME RECEIVED: <u> </u> YY/MM/DD 24 HR									
Reason Submitted: (F3 For Selection)		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: <u> </u> System Number: <u> </u>							
<input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst)		AUTHORIZATION NUMBER: <u> </u>							
<input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) <input type="checkbox"/> CHAIN OF CUSTODY (Tracking Purposes)		Sampling Site Identifier <u> </u>							
ON-SITE ANALYTICAL RESULTS									
WATER TEMPERATURE °C	pH units	COLLECTION METHOD <input type="checkbox"/> GRAB <input type="checkbox"/> COMPOSITE							
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C, E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate									
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: <u> </u>									
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: <u> </u>									
MAIL REPORTS TO:		ORIGINAL							
		COPY 1							
		COPY 2							
BASE SAMPLE NUMBER:		DEGREES CELSIUS							
<u>GL-970636</u>		Armstrong Lab PID: (AL Use Only) <u> </u>							
Date/Time Analysed:		Date/Time Analysed:							
GROUP A Holding Time		GROUP G Holding Time							
COD	28 Days	410.4	mg/L	Acidity, Total	14 Days	305.1	mg/L		
Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total	14 Days	310.2	mg/L		
Date/Time Analysed:					Alkalinity, Bicarbonate	14 Days	310.1	mg/L	
GROUP B Holding Time						Bromide	28 Days	300.0	mg/L
Oil & Grease	28 Days	413	mg/L	Chloride	28 Days	325.2/300.0	mg/L		
TPH	28 Days	418.1	mg/L	Color	48 Hrs	110.2	Units		
Date/Time Analysed:	<u>98004513</u>				Fluoride	28 Days	340.2/300.0	mg/L	
GROUP C Holding Time						Residue, Total	7 Days	160.3	mg/L
Ammonia	28 Days	350.1	37	Residue, Filterable	7 Days	160.1	mg/L		
Kjeldahl Nitrogen	28 Days	351.2	50	Residue, Nonfilterable	7 Days	160.2	mg/L		
Nitrate + Nitrite	28 Days	353.2/300.0	50.1	Residue, Settleable	48 Hrs	160.5	ml/L		
Nitrate	48 Hrs	353.2/300.0	mg/L	Residue, Volatile	7 Days	160.4	mg/L		
Nitrite	48 Hrs	353.2/300.0	mg/L	Silica	28 Days	370.1	mg/L		
Orthophosphate	28 Days	365.1/300.0	mg/L	Specific Conductance	28 Days	120.1	Umho		
Phosphorus, Total	28 Days	365.1/300.0	mg/L	Sulfate	28 Days	375.2/300.0	mg/L		
Date/Time Analysed:					Surfactants-MBAS	48 Hrs	425.1	mg/L	
GROUP D Holding Time						Turbidity	48 Hrs	180.1	Units
Cyanide, Total	14 Days	335.3	mg/L	Langlier Index	28 Days	203			
Cyanide, Free	14 Days	335.1	mg/L	Date/Time Analysed:					
Date/Time Analysed:					GROUP J Holding Time				
GROUP E Holding Time						Sulfides	7 Days	376.1	mg/L
Phenols	28 Days	420.2	11/18/97 ug/L	CHEMIST: <u>BL</u>					
Remarks: <u>0% Solid By Weight: 5.1%</u>						APPROVED BY: <u>CH</u> CHAIN OF CUSTODY			

INORGANIC ANALYSIS REQUEST FORM			AL/OEA USE ONLY	CHAIN OF CUSTODY	
DATE/TIME COLLECTED: <u>97/11/15</u>		YY/MM/DD	24 HR	Mail Samples To: <u>10100</u>	
DATE/TIME RECEIVED: _____		YY/MM/DD	24 HR	ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626	
Reason Submitted: (F3 For Selection)		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: _____			
<input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst)		AUTHORIZATION NUMBER: _____			
<input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) <input type="checkbox"/> CHAIN OF CUSTODY (Tracking Purposes)		Sampling Site Identifier: _____			
ON-SITE ANALYTICAL RESULTS					
WATER TEMPERATURE °C	pH units	COLLECTION METHOD <input type="checkbox"/> GRAB <input type="checkbox"/> COMPOSITE			
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C,E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate					
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: _____					
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: _____					
MAIL REPORTS TO:		ORIGINAL			
USE ASSIGNED BASE CODE:		COPY 1			
		COPY 2			
SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room)					
SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN _____ FAX _____					
SIGNATURE: _____					
DEGREES CELCIUS					
BASE SAMPLE NUMBER: <u>GL970643</u>		Armstrong Lab PID: (AL Use Only) _____			
Date/Time Analysed: _____		Date/Time Analysed: _____			
GROUP A Holding Time		GROUP G Holding Time			
COD	28 Days	410.4	mg/L	Acidity, Total	14 Days 305.1 mg/L
Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total	14 Days 310.2 mg/L
Date/Time Analysed: _____					Alkalinity, Bicarbonate 14 Days 310.1 mg/L
GROUP B Holding Time		Bromide 28 Days 300.0 mg/L			
Oil & Grease	28 Days	413	mg/L	Chloride	28 Days 325.2/300.0 mg/L
TPH	28 Days	418.1	mg/L	Color	48 Hrs 110.2 Units
Date/Time Analysed: _____					Fluoride 28 Days 340.2/300.0 mg/L
GROUP C Holding Time		Residue, Total 7 Days 160.3 mg/L			
Ammonia	28 Days	350.1	21 mg/L	Residue, Filterable 7 Days 160.1 mg/L	
Kjeldahl Nitrogen	28 Days	351.2	28 mg/L	Residue, Nonfilterable 7 Days 160.2 mg/L	
Nitrate + Nitrite	28 Days	353.2/300.0	20.1 mg/L	Residue, Settleable 48 Hrs 160.5 ml/L	
Nitrate	48 Hrs	353.2/300.0	mg/L	Residue, Volatile 7 Days 160.4 mg/L	
Nitrite	48 Hrs	353.2/300.0	mg/L	Silica 28 Days 370.1 mg/L	
Orthophosphate	28 Days	365.1/300.0	mg/L	Specific Conductance 28 Days 120.1 Umho:	
Phosphorus, Total	28 Days	365.1/300.0	mg/L	Sulfate 28 Days 375.2/300.0 mg/L	
Date/Time Analysed: _____					Surfactants-MBAS 48 Hrs 425.1 mg/L
GROUP D Holding Time		Turbidity 48 Hrs 180.1 Units			
Cyanide, Total	14 Days	335.3	mg/L	Langlier Index 28 Days 203	
Cyanide, Free	14 Days	335.1	mg/L	Date/Time Analysed: _____	
Date/Time Analysed: _____					GROUP J Holding Time
GROUP E Holding Time		Sulfides 7 Days 376.1 mg/L			
Phenols	28 Days	420.2	11/18/97 mg/L	CHEMIST: <u>BL</u>	
APPROVED BY: <u>Mark D. Lee</u>					
Remarks: <u>90% Solid By weight, 6.0%</u> CHAIN OF CUSTODY					

INORGANIC ANALYSIS REQUEST FORM

AL/OEA
USE
ONLY

CHAIN OF CUSTODY

DATE/TIME COLLECTED: 97/11/95

YY/MM/DD 24 HR

Mail Samples To:

ARMSTRONG LABORATORY
Occupational & Environmental Health DirectorateDATE/TIME RECEIVED:

YY/MM/DD 24 HR

2402 E. Drive, Bldg 140
Brooks AFB, Texas 78235-5114
DSN: 240-3626 (210) 536-3626Reason Submitted:
(F3 For Selection)IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?
System Name: 10100
System Number: ROUTINE
 CHAIN OF CUSTODY
(Litigation Purposes) PRIORITY (pre-arrange with analyst)
 CHAIN OF CUSTODY
(Tracking Purposes)AUTHORIZATION NUMBER: Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE °C pH COLLECTION METHOD
 units GRAB COMPOSITE

BASE WHERE SAMPLE COLLECTED

HOW WAS THE SAMPLE PRESERVED? Group A-C,E:Sulfuric Acid
 Group D:Sodium Hydroxide Group G:None Group J:Zinc Acetate

SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room)

SAMPLE LOCATION:

 Source Pt of Entry Distribution Other: SAMPLE COLLECTED BY (NAME, GRADE, AFSC)- DSN
FAX

WATER TREATMENT:

 Raw Chlorination Fluoridation Other: SIGNATURE

MAIL REPORTS TO:

ORIGINAL

USE ASSIGNED BASE CODE

COPY 1

COPY 2

SIGNED BASE SAMPLE
NUMBER: GL-970650Armstrong Lab PID:
(AL Use Only) Date/Time
Analysed:Date/Time
Analysed:

GROUP A Holding Time

GROUP G Holding Time

COD 28 Days 410.4 mg/L

Acidity, Total 14 Days 305.1 mg/L

Organic Carbon 28 Days 415.1 mg/L

Alkalinity, Total 14 Days 310.2 mg/L

Date/Time
Analysed:

Alkalinity, Bicarbonate 14 Days 310.1 mg/L

GROUP B Holding Time

Bromide 28 Days 300.0 mg/L

Oil & Grease 28 Days 413 mg/L

Chloride 28 Days 325.2/300.0 mg/L

TPH 28 Days 418.1 mg/L

Color 48 Hrs 110.2 Units

Date/Time
Analysed:

Fluoride 28 Days 340.2/300.0 mg/L

GROUP C Holding Time

Residue, Total 7 Days 160.3 mg/L

14 Nov 97 48004515

Residue, Filterable 7 Days 160.1 mg/L

Date/Time
Analysed:

Residue, Nonfilterable 7 Days 160.2 mg/L

GROUP D Holding Time

Residue, Settleable 48 Hrs 160.5 ml/L

Ammonia 28 Days 350.1 0.01 mg/L

Residue, Volatile 7 Days 160.4 mg/L

Kjeldahl Nitrogen 28 Days 351.2 0.42 mg/L

Silica 28 Days 370.1 mg/L

Nitrate + Nitrite 28 Days 353.2/300.0 0.00 mg/L

Specific Conductance 28 Days 120.1 Umho:

Nitrate 48 Hrs 353.2/300.0 mg/L

Sulfate 28 Days 375.2/300.0 mg/L

Nitrite 48 Hrs 353.2/300.0 mg/L

Surfactants-MBAS 48 Hrs 425.1 mg/L

Orthophosphate 28 Days 365.1/300.0 mg/L

Turbidity 48 Hrs 180.1 Units

Phosphorus, Total 28 Days 365.1/300.0 mg/L

Langlier Index 28 Days 203

Date/Time
Analysed:

GROUP E Holding Time

Sulfides 7 Days 376.1 mg/L

Cyanide, Total 14 Days 335.3 mg/L

CHEMIST: Blair

Cyanide, Free 14 Days 335.1 mg/L

Date/Time
Analysed:

GROUP F Holding Time

Phenols 28 Days 420.2 ug/L

Remarks: 0.0 Sc/L D By WeightAPPROVED BY W. M. DeLoach

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM			AL/OEA USE ONLY	CHAIN OF CUSTODY			
DATE/TIME COLLECTED: <u>97/11/15</u> YY/MM/DD 24 HR			Mail Samples To: ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626 <u>10/10/00</u>				
DATE/TIME RECEIVED: _____ YY/MM/DD 24 HR			IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: _____ System Number: _____				
<input type="checkbox"/> ROUTINE <input type="checkbox"/> PRIORITY (pre-arrange with analyst) <input type="checkbox"/> CHAIN OF CUSTODY <input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes) (Tracking Purposes)			AUTHORIZATION NUMBER: _____ Sampling Site Identifier: _____				
ON-SITE ANALYTICAL RESULTS							
WATER TEMPERATURE °C	pH units	COLLECTION METHOD □ GRAB □ COMPOSITE	BASE WHERE SAMPLE COLLECTED				
HOW WAS THE SAMPLE PRESERVED? <input type="checkbox"/> Group A-C,E:Sulfuric Acid <input type="checkbox"/> Group D:Sodium Hydroxide <input type="checkbox"/> Group G:None <input type="checkbox"/> Group J:Zinc Acetate			SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room)				
SAMPLE LOCATION: <input type="checkbox"/> Source <input type="checkbox"/> Pt of Entry <input type="checkbox"/> Distribution <input type="checkbox"/> Other: _____			SAMPLE COLLECTED BY (NAME, GRADE, AFSC) <u>ARMSTRONG</u> DSN: _____ FAX: _____				
WATER TREATMENT: <input type="checkbox"/> Raw <input type="checkbox"/> Chlorination <input type="checkbox"/> Fluoridation <input type="checkbox"/> Other: _____			SIGNATURE <u>JO</u>				
MAIL REPORTS TO:		ORIGINAL					
USE ASSIGNED BASE CODE:		COPY 1					
COPY 2							
BASE SAMPLE NUMBER: <u>GL970657</u>		Armstrong Lab PID: (AL Use Only) <u>1234567890</u>		SAMPLES COLLECTED			
Date/Time Analysed:		Date/Time Analysed:		GROUP G Holding Time			
GROUP A Holding Time							
COD	28 Days	410.4	mg/L	Acidity, Total	14 Days 305.1 mg/L		
Organic Carbon	28 Days	415.1	mg/L	Alkalinity, Total	14 Days 310.2 mg/L		
Date/Time Analysed:					Alkalinity, Bicarbonate 14 Days 310.1 mg/L		
GROUP B Holding Time				Bromide	28 Days 300.0 mg/L		
Oil & Grease	28 Days	413	mg/L	Chloride	28 Days 325.2/300.0 mg/L		
TPH	28 Days	418.1	mg/L	Color	48 Hrs 110.2 Unit		
Date/Time Analysed:					Fluoride	28 Days 340.2/300.0 mg/L	
GROUP C Holding Time <u>98004516</u>				Residue, Total	7 Days 160.3 mg/L		
Ammonia	28 Days	350.1	mg/L	Residue, Filterable	7 Days 160.1 mg/L		
Kjeldahl Nitrogen	28 Days	351.2	mg/L	Residue, Nonfilterable	7 Days 160.2 mg/L		
Nitrate + Nitrite	28 Days	353.2/300.0	mg/L	Residue, Settleable	48 Hrs 160.5 ml/L		
Nitrate	48 Hrs	353.2/300.0	mg/L	Residue, Volatile	7 Days 160.4 mg/L		
Nitrite	48 Hrs	353.2/300.0	mg/L	Silica	28 Days 370.1 mg/L		
Orthophosphate	28 Days	365.1/300.0	mg/L	Specific Conductance	28 Days 120.1 Umho		
Phosphorus, Total	28 Days	365.1/300.0	mg/L	Sulfate	28 Days 375.2/300.0 mg/L		
Date/Time Analysed:					Surfactants-MBAS	48 Hrs 425.1 mg/L	
GROUP D Holding Time				Turbidity	48 Hrs 180.1 Unit		
Cyanide, Total	14 Days	335.3	mg/L	Langlier Index	28 Days 203		
Cyanide, Free	14 Days	335.1	mg/L	Date/Time Analysed:			
Date/Time Analysed:					GROUP J Holding Time		
GROUP E Holding Time				Sulfides	7 Days 376.1 mg/L		
Phenols	28 Days	420.2	ug/L	CHEMIST: <u>JO</u>			
Remarks: <u>0% SOLID By Weight 2.1%</u>		APPROVED BY <u>JO</u> CHAIN OF CUSTODY					

INORGANIC ANALYSIS REQUEST FORM			AL/OEA USE ONLY	CHAIN OF CUSTODY	
DATE/TIME COLLECTED:	97/11/5 YY/MM/DD		Mail Samples To:	ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626	
DATE/TIME RECEIVED:	YY/MM/DD		10/00		
Reason Submitted: (F3 For Selection)	IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name:		System Number:		
<input type="checkbox"/> ROUTINE	<input type="checkbox"/> PRIORITY (pre-arrange with analyst)		AUTHORIZATION NUMBER:		
<input type="checkbox"/> CHAIN OF CUSTODY (Litigation Purposes)	<input type="checkbox"/> CHAIN OF CUSTODY (Tracking Purposes)		Sampling Site Identifier		
ON-SITE ANALYTICAL RESULTS			BASE WHERE SAMPLE COLLECTED		
WATER TEMPERATURE °C	pH units	COLLECTION METHOD □ GRAB □ COMPOSITE	SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room		
HOW WAS THE SAMPLE PRESERVED? □ Group D:Sodium Hydroxide □ Group G:None □ Group J:Zinc Acetate			SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN FAX		
SAMPLE LOCATION: □ Source □ Pt of Entry □ Distribution □ Other: _____			SIGNATURE		
WATER TREATMENT: □ Raw □ Chlorination □ Fluoridation □ Other: _____			F		
MAIL REPORTS TO: <i>(USE ASSIGNED BASE CODE)</i>			DEPARTMENT/SECTION		
ORIGINAL					
COPY 1					
COPY 2					
BASE SAMPLE NUMBER:		GL970664	Armstrong Lab PID: (AL Use Only)		
Date/Time Analysed:			Date/Time Analysed:		
GROUP A Holding Time			GROUP G Holding Time		
COD	28 Days	410.4	Acidity, Total	14 Days	305.1
Organic Carbon	28 Days	415.1	Alkalinity, Total	14 Days	310.2
Date/Time Analysed:			Alkalinity, Bicarbonate	14 Days	310.1
GROUP B Holding Time			Bromide	28 Days	300.0
Oil & Grease	28 Days	413	Chloride	28 Days	325.2/300.0
TPH	28 Days	418.1	Color	48 Hrs	110.2
Date/Time Analysed:			Fluoride	28 Days	340.2/300.0
GROUP C Holding Time		98004517	Residue, Total	7 Days	160.3
Ammonia	28 Days	350.1	Residue, Filterable	7 Days	160.1
Kjeldahl Nitrogen	28 Days	351.2	Residue, Nonfilterable	7 Days	160.2
Nitrate + Nitrite	28 Days	353.2/300.0	Residue, Settleable	48 Hrs	160.5
Nitrate	48 Hrs	353.2/300.0	Residue, Volatile	7 Days	160.4
Nitrite	48 Hrs	353.2/300.0	Silica	28 Days	370.1
Orthophosphate	28 Days	365.1/300.0	Specific Conductance	28 Days	120.1
Phosphorus, Total	28 Days	365.1/300.0	Sulfate	28 Days	375.2/300.0
Date/Time Analysed:			Surfactants-MBAS	48 Hrs	425.1
GROUP D Holding Time			Turbidity	48 Hrs	180.1
Cyanide, Total	14 Days	335.3	Langlier Index	28 Days	203
Cyanide, Free	14 Days	335.1	Data/Time Analysed:		
Date/Time Analysed:			GROUP J Holding Time		
GROUP E Holding Time			Sulfides	7 Days	376.1
Phenols	28 Days	420.2	CHEMIST: Bl A		
Remarks: 97% SOLID By Weight: 74.6%			APPROVED BY: AF FORM 2752A, OCT 95 CHAIN OF CUSTODY		

MTVL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885



99000

CHAIN OF CUSTODY RECORD

PHONE 701/258-9720 FAX 701/258-9724
EUC-213-3355

PROJECT NO:	PROJECT NAME OR LOCATION: Minut AFB				REPORT TO:	BILL TO:		
HWYL NO#:	NAME OF SAMPLER: Miss. Doris Dehner				See page 1			
HWYL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE #	SAMPLE SITE	COMMENTS OF SAMPLE		
						ANALYSIS REQUESTED	C	C PT PH COMMENTS
M1249	GL970540	3/10/97	1030		Site 2 miss. 2500 ft Frac. Col. Cern	X	X	X
M1250	GL970541		1035			X	X	X
M1251	GL970542		1040			X	X	X
M1252	GL970543		1045			X	X	X
M1253	GL970544		1050			X	X	X
M1254	GL970545		1055		Site 3 miss. 2500 ft frac. Cern	X	X	X
M1255	GL970546		1300			X	X	X
M1256	GL970547		1320			X	X	X
M1257	GL970548		1325			X	X	X

Page 2 of 7



MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885

PHONE 701/258-9720 FAX 701/258-9724

CHAIN OF CUSTODY RECORD

PROJECT NO:	PROJECT NAME OR LOCATION: Minot AFB					REPORT TO:	BILL TO:	
MVTL LAB #	NAME OF SAMPLER:	SAMPLE DATE	SAMPLE TIME	SOIL TYPE	MISC	SAMPLE SITE	ANALYSIS REQUESTED	COMMENTS OF SAMPLE
M1276	GL9705167	Nov 3 97	1400	Sludge	Steel Midwest Inc	Fecal Coliform	C	X
M1277	GL9705168		1405				X	98006205
M1278	GL9705169		1410				X	98006206
M1279	GL970570		1415				X	98006207
M1280	GL970571		1420				X	98006208
M1281	GL970572		1425				X	98006209
M1282	GL970573		1535			Site 7 missile site D1	X	98006210
M1283	GL970574		1520			Specular flint	X	98006211
M1284	GL970575		1505				X	98006212
REMARKS ON SITE/CONTENTS ON SAMPLES: Resurfaced 4c military zone 1400 = 2pm, 500 = 3pm								
G = Grab Sample C = Composite Sample P = Preserved Sample Y = Yes N = No								
SAMPLE RECEIVED BY:	(initials)	DATE	TIME	CONTENTS	SAMPLE RECEIVED BY:	(initials)	DATE	TIME
David A. Dahmen		11/14/97	0705		David A. Dahmen		11/14/97	14:30

Page 5 of 7



MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504

97010

PHONE 701/258-9720 FAX 701/258-9724

CHAPTER ONE: CUSTOMARY ECOLOGY

PROJECT NO:	PROJECT NAME OR LOCATION: Minot AFB				REPORT TO:	BILL TO:					
MVTL NO:	NAME OF SAMPLER: <u>MSgt Deois Dahne</u>				See Regel						
MVTL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SOIL	SAMPLE SITE		ANALYSIS REQUESTED	COMMENTS OF SAMPLE			
				HR	HR	HR		C	C	PP	COMMENTS
M1285	GL970576	Nov 3 97	1510	Sludge	Site 7 Minot AFB		Feccal Coliform	X	X	X	98006216
M1286	GL970577		1515	Sludge	Primary Pct						98006216
M1287	GL970578		1525	"	"						98006216
M1288	GL970579		1530	"	"						98006216
M1289	GL970580		1505	Site 8 Minot AFB	Site 8 Minot AFB						98006216
M1290	GL970581		1510	"	"						98006216
M1291	GL970582		1515	"	"						98006220
M1292	GL970583		1540	"	"						98006221
M1293	GL970584		1535	"	"						98006222
REMARKS ON SITE/COMMENTS ON SAMPLES: Refrigerate 4°C											
ES Military terms 1500 = 3pm 1400 = 2pm											
*C = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No											
SAMPLES RECEIVED BY:				SAMPLES RECEIVED BY:				DATE (DD/MM/YY)			
David A. Dahne				11/04/97 0805				11/04/97 14:20			

Page 6 of 7

MTVL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504

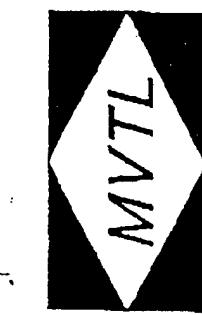
The logo for MVTL is a diamond-shaped emblem. Inside the diamond, the letters "MVTL" are written in a bold, sans-serif font, oriented vertically from bottom to top.

8800-2/3-6888
PHONE 701/258-9720 FAX 701/258-9724

CHAIN OF CUSTODY RECORD

Page 7 of 7

PL



MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885

PHONE 701/258-9720 FAX 701/258-9724

D.S. Clay M

ACCQ1

777 000

CHAIN OF CUSTODY RECORD

PROJECT PO:	PROJECT NAME OR LOCATION:				REPORT TO:				BILL TO:			
MVTL LAB #	DESCRIPTION	SAMPLE DATE	SAMPLE TIME	LAB #	NAME OF SAMPLER:	TEST	TEST	TEST	TEST	TEST	TEST	TEST
M1305	GL970587	4/10/97	0950		Donna A. Johnson	9000	1000	2402 E. Brooks	Det 1 HSC/CEA	2402 E. Brooks	Det 1 HSC/CEA	2402 E. Brooks
M1306	GL970588		0955									
M1307	GL970589		1015									
M1308	GL970590		1020									
M1309	GL970591		1025									
M1310	GL970592		1000									
M1311	GL970593		1005									
M1312	GL970594		0950									
M1313	GL970595		0955									

REMARKS ON SITE/COMMENTS ON SAMPLES:

"C" = Grab sample "C" = Composite sample "P" = Preserved sample "Y" = Yes "N" = No

SAMPLE REQUESTED BY:	DATE	TIME	CONTENTS	SAMPLE RECEIVED BY:	DATE	TIME
Donna A. Johnson	11/04/97	1700		Det 1 HSC/CEA Brooks, Sherrill	11/04/97	1705
K. Sherrill	11/15/97	1700			11/15/97	0800

Page 1 of 7



MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885

PHONE 701/258-9720 FAX 701/258-9724

CHAIN OF CUSTODY RECORD

PROJECT PO: MVTL WO#:	PROJECT NAME OR LOCATION: Minot AFB See page 1	REPORT TO: See page 1	BILL TO: See page 1		
MVTL LAB #	NAME OF SAMPLER: Mst. Dall Althausen	SAMPLE SITE	ANALYSIS REQUESTED	COMMENTS OF SAMPLE	
		DATE	TIME	TESTS	C P N COMMENTS
M134	GL970596	4 Nov 97	1000	Site 10 missile site F	X
M135	GL970597		1005		X 98006240
M136	GL970598		1015		X 98006241
M137	GL970599		1025		X 98006242
M138	GL970600		1035		X 98006243
M139	GL970601		1050	Site 11 missile site F	X 98006244
M130	GL970602		1055	primarily gone	X 98006245
M131	GL970603		1110		X 98006246
M132	GL970604		1115		X 98006247
					X 98006248

REMARKS ON SITE/COMMENTS ON SAMPLES:

*G = Grab Sample *C = Composite Sample *P = Preserved Sample *T = Yes *N = No
SAMPLES RECEIVED BY: DATE: (Mo/Day/Year) DATE: (Mo/Day/Year)

Doris A. Althausen	11/04/97	1700	Comments	Sample Received by: Doris A. Althausen	DATE: (Mo/Day/Year)
R. Scheetz	11/15/97	1700		R. Scheetz	11/04/97 1700
					11/15/97 1700

Page 2 of 7

X



MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885

PHONE 701/258-9720 FAX 701/258-9724

CHAIN OF CUSTODY RECORD

PROJECT PO:	PROJECT NAME OR LOCATION: <i>Mn015FB</i>			REPORT TO:	BILL TO: <i>See</i>					
MVTL LAB #:	NAME OF SAMPLER: <i>M. Scott Dohner</i>	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE SITE	ANALYSIS REQUESTED	CONTENTS OF SAMPLE			
						o	c	ft	fw	contents
M1323	GL970605	4/16/97	1125		Sludge	Site 11 missile site F1 primary	X			98006249
M1324	GL970606		1100							98006250
M1325	GL970607		1105							98006251
M1326	GL970608		1050							98006252
M1327	GL970609		1100							98006253
M1328	GL970610		1105							98006254
M1329	GL970611		1115							98006255
M1330	GL970612		1120							98006256
M1331	GL970613		1125							98006257

REMARKS ON SITE/CONTENTS ON SAMPLES:

*C = Crab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLE RECEIVED BY:	DATE	TIME	CONTENTS	SAMPLE RECEIVED BY:	DATE	TIME	CONTENTS
<i>Ron A. Dohner</i>	11/04/97	1700		<i>Ron Thomas</i>	11/04/97	1705	
<i>R. Scheetz</i>	11/15/97	1700		<i>R. Scheetz</i>	11/15/97	0808	
				<i>Fred Eng</i>	11/15/97	1700	

Page 3 of 7



MYTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504

800-279-6885 PHONE 701/258-9720 FAX 701/258-9721

CHAIN OF CUSTODY BECOMES

PROJECT NO:		PROJECT NAME OR LOCATION: Minot AFB		REPORT TO: See page 1		BILL TO: See page 1				
MVTL NO:		NAME OF SAMPLER: A. Set Dohnec		ANALYSIS REQUESTED		COMMENTS OF SAMPLE				
MVTL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE TYPE	SAMPLE SITE	o	c	py	pn	coconuts
M1332	SL970614	4 Nov 97	1130	Sludge	Site 12 missile site F1 Secondary sample	X		X		9800625
M1333	SL970615		1315		Site 13 missile site G1 Secondary sample					9800625
M1334	SL970616		1320							9800626
M1335	SL970617		1335							9800626
M1336	SL970618		1340							9800626
M1337	SL970619		1345							9800626
M1338	SL970620		1325							9800626
M1339	SL970621		1330							9800626
M1340	SL970622		1315		Site 11 missile site G1 Secondary sample					9800626

Page 4 of 7

MVT LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885



PHONE 701/258-9720 FAX 701/258-9724

CHAIN OF CUSTODY RECORD

PROJECT PO: MVTL W#:	PROJECT NAME OR LOCATION: Mvtl AFb MS#	REPORT TO: See Page 1	BILL TO: See Page 1					
MVTL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SOIL	WATER	SAMPLE SITE	ANALYSIS REQUESTED	COMMENTS OR SAMPLE
M1341	GT970623	4 Nov 97	1320			Site 14 mississippi River Shallow secondary point	Fecal coliform	X
M1342	GT970624		1325					X
M1343	GT970625		1330					98006268
M1344	GT970626		1335					98006269
M1345	GT970627		1340					98006270
M1346	GT970628		1345					
M1347	GT970629		1155			Site 15 mississippi River primarily point		98006271
M1348	GT970630		1200					98006272
M1349	GT970631		1220					98006273
								98006274
								98006275

REMARKS ON SITE/COMMENTS ON SAMPLES:

"G" = Grab Sample "C" = Composite Sample "P" = Preserved Sample "Y" = Yes "N" = No

SAMPLE NUMBERED BY:	NAME	TIME	CONTENTS	SAMPLE NUMBERED BY:	NAME	TIME
Doris A. Dahner	11/09/97	1700		Bob Thorne	11/04/97	1705
R. Schuetz	11/10/97	1700		R. Schuetz	11/10/97	0800

Aug 25 97

X



MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885

PHONE 701/258-9720 FAX 701/258-9724

CHAIN OF CUSTODY RECORD

PROJECT PO:	PROJECT NAME OR LOCATION: <i>Minit FEB</i>			REPORT TO:	BILL TO:		
MVTL WO#:	NAME OF SAMPLER: <i>Msgt. Dennis Nahner</i>			See Page 1	See page 1		
ITEM# LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE SITE	ANALYSIS REQUESTED		
M1350	6L970632	4/6/97	1225	Shingle Site 15 Mississippie River primarily sand	Fecal Coliform	Y	
M1351	6L970633		1230				X
M1352	6L970634		1205				X
M1353	6L970635		1210				X
M1354	6L970636		1155				X
M1355	6L970637		1200				X
M1356	6L970638		1220				X
M1357	6L970639		1225				X
M1358	6L970640		1230				X

REMARKS ON SITE/COMMENTS ON SAMPLES:

*G = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLE NUMBERED BY:	DATE	TIME	COMMENTS	ANALYST RECEIVED BY:	DATE	TIME
<i>Dennis Nahner</i>	11/04/97	1700		<i>Rof. Dunes</i>	11/04/97	1705
<i>R. Schell</i>	11/15/97	1700		<i>R. Schell</i>	11/15/97	1700
				<i>Red Elk</i>	11/15/97	1700

Page 6 of 7

MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504



47900

CHAIN OF CUSTODY RECORD

PHONE 701/258-9720 FAX 701/258-9724

THE JOURNAL OF CLIMATE

Digitized by srujanika@gmail.com

SAMPLES REQUESTED BY:	DATE	TIME	COMMENTS	SAMPLE RECEIVED BY:	DATE	TIME
John A Johnson	11/04/97	1000		Bob Thomas	11/04/97	1205

R. Sheeky 115197 1700 B. Sheeky 115198

10

Page 7 of 7



MVTL LABORATORIES, INC.
 1411 S. 12TH STREET
 BISMARCK, ND 58504
 800-279-6885
 PHONE 701/258-9720 FAX 701/258-9724

CHAIN OF CUSTODY RECORD

PROJECT NO:		PROJECT NAME OR LOCATION: Minot AFB				REPORT TO: Det 1 HSC/AFB				BILL TO: 2402 E Drive			
MVTL WO#:		NAME OF SAMPLER: Mrs. A. Dohner				Brooks AFB TX 76235				Books AFB TX			
MVTL LAB #	DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SOIL	WATER	SAMPLE SITE	ANALYSIS REQUESTED	C	C	PY	PW	COMMENTS	
M1382	GL970643	5/19/97	0930			Sludge	Fecal Coliform	X	X				
M1383	GL970644		0935										
M1384	GL970645		0950										
M1385	GL970646		0955										
M1386	GL970647		1000										
M1387	GL970648		0940										
M1388	GL970649		0945										
M1389	GL970650		0930										
M1390	GL970651	~	0940										

REMARKS ON SITE/COMMENTS ON SAMPLES: # Site had lots of cow manure

*C = Grab Sample *P = Preserved Sample *W = Yes *N = No

SAMPLES RECEIVED BY: DATE (Mo/Day/Year) TIME SAMPLES RECEIVED BY: DATE (Mo/Day/Year) TIME

Doris A. Dohner 11/05/97 1315 11/5/97 1:10
 R. Scheetz 11/06/97 1700 11/6/97 0800
 R. Scheetz 11/06/97 1700 11/6/97 1700
 Doris A. Dohner 11/7/97 0300

Page 1 of 4



MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885

PHONE 701/258-9720 FAX 701/258-9724

CHAIN OF CUSTODY RECORD

PROJECT PO: MVTL WO#:	PROJECT NAME OR LOCATION: Minot AFB		REPORT TO: See Page 1	BILL TO: See Page 1					
MVTL LAB #	DESCRIPTION	SAMPLE DATE	SAMPLE TIME	MISC	SAMPLE SITE	ANALYSIS REQUESTED	COMMENTS OF SAMPLE		
M1391	G1970652	5/16/97	0935		sludge	site 15518350001	X	X	X
M1392	G1970653		0945				X	X	X
M1393	G1970654		0950				X	X	X
M1394	G1970655		0955				X	X	X
M1395	G1970656		1000				X	X	X
M1396	G1970657		1035		site of missile site J pump jack		X	X	X
M1397	G1970658		1040				X	X	X
M1398	G1970659		1055				X	X	X
M1399	G1970660		1100				X	X	X

REMARKS ON SITE/COMMENTS ON SAMPLES: X Site contained lots of cow manure

*G = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLE RELINQUISHED BY:	DATE (Mo/Day/Yr)	TIME	COMMENTS	SAMPLE RECEIVED BY:	DATE (Mo/Day/Yr)	TIME
Don A. Dahmer	11/05/97	1315		R. Schrey	11/16/97	0800
R. Schrey	11/16/97	1705		Fed Ex	11/16/97	1700
				Amy Dreher	11/17/97	1032

Page 2 of 4



MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504

800-279-6885
PHONE 701/258-9720 FAX 701/258-9724

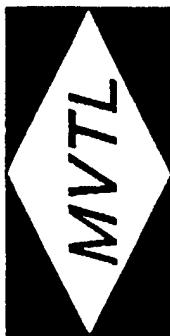
CHAIN OF CUSTODY RECORD

REMARKS ON SITE/COMMENTS ON SAMPLES:

*C = Crab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RETRIEVED BY:	DATES (mo./day/yr.)	TIME	CONTENTS	SAMPLES RECEIVED BY:	DATE (mo./day/yr.)	TDS
Dominic A. Abones	11/10/97	1315		R. Schecter	11/10/97	0801
R. Schecter	11/10/97	1700		Fed. Ex.	11/10/97	1700

Page 2 3 of 4



MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885

PHONE 701/258-9720 FAX 701/258-9724

CHATTIN OF CUSTODY RECORD

APPENDIX B: COMMENTS ON SAMPLES:

*Y = Yes *N = No
*C = Grab Sample *P = Preserved Sample

SAMPLES ACQUISITION BY:		DATE (DD/MM/YY)	TIME	DATE (DD/MM/YY)	TIME
<i>David A. Johansen</i>	<i>R. Scheetz</i>	11/05/97	13:15	11/05/97	09:00
		11/06/97	07:00	11/06/97	07:00

Page 4 of 4

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix C

Calculating CFU/gram Total Solids

Converting CFU/100 ml to CFU/L

$$\frac{(\text{CFU}/100 \text{ ml})(1000 \text{ ml}/\text{L})}{\text{CFU}/\text{L}}$$

Converting % solids to mg/L Total Solids (TS)

$$\frac{(\%/100)(\text{mg}/\text{L TS})}{\text{mg}/\text{L TS}}$$

Calculating CFU/mg TS

$$\frac{(\text{CFU}/\text{L}) / (\text{mg}/\text{L TS})}{\begin{aligned} &(10 \text{ CFU}/\text{L})(\text{L}/\text{mg TS}) \\ &[(\text{CFU})(\text{mg TS})](0.1) \\ &\text{CFU}/\text{mg TS} \end{aligned}}$$

Converting CFU/ mg TS to CFU/g TS

$$\frac{(\text{CFU}/\text{mg})(0.001 \text{ mg}/\text{g TS})}{\text{CFU}/\text{g TS}}$$

Converting from CFU/100ml to CFU/L					
Missile Site A1 Primary Sample Numbers GL970531-GL970537					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)		
10	100	<100	Formula = (% TS/100)*(mg/L)		
10000	100000				
30000	300000		% TS	mg/L TS	
50000	500000		1.7	0.017	
10000	100000				
15000	150000				
4000	40000				
Calculating CFU/mg TS		Calculating CFU/g TS			
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS		
1.7	<1.7	0.0017	<0.0017		
1700		1.7			
5100		5.1			
8500		8.5			
1700		1.7			
2550		2.55			
680		0.68			
Converting from CFU/100ml to CFU/L					
Missile Site A1 Secondary Sample Numbers GL970538-GL970544					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)		
10	100	<100	Formula = (% TS/100)*(mg/L)		
10	100	<100			
1000	10000		% TS	mg/L TS	
10	100	<100	54.4	0.544	
10	100	<100			
10	100	<100			
10	100	<100			
Calculating CFU/mg TS		Calculating CFU/g TS			
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS		
54.4	<54.4	0.0544	<0.0544		
54.4	<54.4	0.0544	<0.0544		
5440		5.44			
54.4	<54.4	0.0544	<0.0544		
54.4	<54.4	0.0544	<0.0544		
54.4	<54.4	0.0544	<0.0544		
54.4	<54.4	0.0544	<0.0544		

Converting from CFU/100ml to CFU/L					
Missile Site B1 Primary Sample Numbers GL970545-GL970551					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L		Converting % Solids to mg/L Total Solids (TS)		
6000	60000		Formula = (% TS/100)*(mg/L)		
10000	100000				
11000	110000		% TS	mg/L TS	
18000	180000		0.7	0.007	
6000	60000				
7000	70000				
7000	70000				
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS			
420		0.42			
700		0.7			
770		0.77			
1260		1.26			
420		0.42			
490		0.49			
490		0.49			
Converting from CFU/100ml to CFU/L					
Missile Site B1 Secondary Sample Numbers GL970552-GL970558					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)		
10	100	<100	Formula = (% TS/100)*(mg/L)		
10	100	<100			
10	100	<100	% TS	mg/L TS	
10	100	<100	80.8	0.808	
10	100	<100			
40000	400000				
10	100	<100			
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS		
80.8	<80.8	0.0808	<0.0808		
80.8	<80.8	0.0808	<0.0808		
80.8	<80.8	0.0808	<0.0808		
80.8	<80.8	0.0808	<0.0808		
80.8	<80.8	0.0808	<0.0808		
323200		323.2			
80.8	<80.8	0.0808	<0.0808		

Converting from CFU/100ml to CFU/L				
Missile Site C1 Primary Sample Numbers GL970559-GL970565				
Formula for Calculation (CFU/100 ml)*(1000ml/L)				
CFU/100 ml	CFU/L	Converting % Solids to mg/L Total Solids (TS) Formula = (% TS/100)*(mg/L)		
3000	30000			
4000	40000			
1600000	16000000	% TS	mg/L TS	
300000	3000000	2.6	0.026	
1000	10000			
1000	10000			
1000	10000			
Calculating CFU/mg TS Formula = (CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)		
CFU/ mg TS	CFU/ mg TS	CFU/g TS		
780		0.78		
1040		1.04		
416000		416		
78000		78		
260		0.26		
260		0.26		
260		0.26		
Converting from CFU/100ml to CFU/L				
Missile Site C1 Secondary Sample Numbers GL970566-GL970572				
Formula for Calculation (CFU/100 ml)*(1000ml/L)				
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS) Formula = (% TS/100)*(mg/L)	
10	100	<100		
10	100	<100		
10	100	<100	% TS	mg/L TS
10	100	<100	66.8	0.668
10	100	<100		
10	100	<100		
10	100	<100		
Calculating CFU/mg TS Formula = (CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)		
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS	
66.8	<66.8	0.0668	<0.0668	
66.8	<66.8	0.0668	<0.0668	
66.8	<66.8	0.0668	<0.0668	
66.8	<66.8	0.0668	<0.0668	
66.8	<66.8	0.0668	<0.0668	
66.8	<66.8	0.0668	<0.0668	
66.8	<66.8	0.0668	<0.0668	

Converting from CFU/100ml to CFU/L								
Missile Site D1 Primary Sample Numbers GL970573-GL970579								
Formula for Calculation (CFU/100 ml)*(1000ml/L)								
CFU/100 ml	CFU/L		Converting % Solids to mg/L Total Solids (TS)					
1000	10000		Formula = (% TS/100)*(mg/L)					
5000	50000		% TS					
1100	11000		mg/L TS					
15000	150000		8.9					
13000	130000							
1000	10000							
3000	30000							
Calculating CFU/mg TS		Calculating CFU/g TS						
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)						
CFU/ mg TS	CFU/ mg TS	CFU/g TS						
890		0.89						
4450		4.45						
979		0.979						
13350		13.35						
11570		11.57						
890		0.89						
2670		2.67						
Converting from CFU/100ml to CFU/L								
Missile Site D1 Secondary Sample Numbers GL970580-GL970586								
Formula for Calculation (CFU/100 ml)*(1000ml/L)								
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)					
10	100	<100	Formula = (% TS/100)*(mg/L)					
10	100	<100	% TS					
80000	800000		mg/L TS					
10	100	<100	51.2					
10	100	<100	0.512					
10	100	<100						
30000	300000							
Calculating CFU/mg TS		Calculating CFU/g TS						
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)						
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS					
51.2	<51.2	0.0512	<0.0512					
51.2	<51.2	0.0512	<0.0512					
409600		409.6						
51.2	<51.2	0.0512	<0.0512					
51.2	<51.2	0.0512	<0.0512					
51.2	<51.2	0.0512	<0.0512					
153600		153.6						

Converting from CFU/100ml to CFU/L
Missile Site E1 Primary Sample Numbers GL970587-GL970593
Formula for Calculation (CFU/100 ml)*(1000ml/L)

CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)	
5000	50000			
6000	60000			
1000000	10000000		% TS	mg/L TS
47000	470000		0.4	0.004
10000	100000			
10000	100000			
12000	120000			

Calculating CFU/mg TS
Formula=(CFU/L)/(mg/L)

Calculating CFU/g TS
Formula = (CFU/mg)*(0.001mg/g)

CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS
200		0.2	
240		0.24	
40000		40	
1880		1.88	
400		0.4	
400		0.4	
480		0.48	

Converting from CFU/100ml to CFU/L
Missile Site E1 Secondary Sample Numbers GL970594-GL97060
Formula for Calculation (CFU/100 ml)*(1000ml/L)

CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)	
10	100	<100		
10	100	<100		
10	100	<100		
10	100	<100	% TS	mg/L TS
10	100	<100	65.9	0.659
10	100	<100		
10	100	<100		
10	100	<100		

Calculating CFU/mg TS
Formula=(CFU/L)/(mg/L)

Calculating CFU/g TS
Formula = (CFU/mg)*(0.001mg/g)

CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS
65.9	<65.9	0.0659	<0.0659
65.9	<65.9	0.0659	<0.0659
65.9	<65.9	0.0659	<0.0659
65.9	<65.9	0.0659	<0.0659
65.9	<65.9	0.0659	<0.0659
65.9	<65.9	0.0659	<0.0659
65.9	<65.9	0.0659	<0.0659

Converting from CFU/100ml to CFU/L				
Missile Site F1 Primary Sample Numbers GL970601-GL970607				
Formula for Calculation (CFU/100 ml)*(1000ml/L)				
CFU/100 ml	CFU/L		Converting % Solids to mg/L Total Solids (TS)	
16000	160000		Formula = (%TS/100)*(mg/L)	
17000	170000		% TS mg/L TS	
36000	360000		2.9	0.029
100000	1000000			
34000	340000			
11000	110000			
13000	130000			
Calculating CFU/mg TS		Calculating CFU/g TS		
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)		
CFU/ mg TS	CFU/ mg TS	CFU/g TS		
4640		4.64		
4930		4.93		
10440		10.44		
29000		29		
9860		9.86		
3190		3.19		
3770		3.77		
Converting from CFU/100ml to CFU/L				
Missile Site F1 Secondary Sample Numbers GL970608-GL970614				
Formula for Calculation (CFU/100 ml)*(1000ml/L)				
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)	
10	100	<100	Formula = (%TS/100)*(mg/L)	
10	100	<100	% TS mg/L TS	
10	100	<100	48.7	0.487
10	100	<100		
10	100	<100		
10	100	<100		
Calculating CFU/mg TS		Calculating CFU/g TS		
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)		
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS	
48.7	<48.7	0.0487	<0.0487	
48.7	<48.7	0.0487	<0.0487	
48.7	<48.7	0.0487	<0.0487	
48.7	<48.7	0.0487	<0.0487	
48.7	<48.7	0.0487	<0.0487	
48.7	<48.7	0.0487	<0.0487	
48.7	<48.7	0.0487	<0.0487	

Converting from CFU/100ml to CFU/L			
Missile Site G1 Primary Sample Numbers GL970615-GL970621			
Formula for Calculation (CFU/100 ml)*(1000ml/L)			
CFU/100 ml	CFU/L	Converting % Solids to mg/L Total Solids (TS) Formula = (% TS/100)*(mg/L)	% TS mg/L TS
1000	10000		
1000	10000		
230000	2300000		
68000	680000		0.9 0.009
16000	160000		
3000	30000		
7000	70000		
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)	
CFU/ mg TS	CFU/ mg TS	CFU/g TS	
90		0.09	
90		0.09	
20700		20.7	
6120		6.12	
1440		1.44	
270		0.27	
630		0.63	
Converting from CFU/100ml to CFU/L			
Missile Site G1 Secondary Sample Numbers GL970622-GL970628			
Formula for Calculation (CFU/100 ml)*(1000ml/L)			
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS) Formula = (% TS/100)*(mg/L)
10	100	<100	
10	100	<100	
10	100	<100	
10	100	<100	
10	100	<100	
10	100	<100	
10	100	<100	
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)	
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS
83.2	<83.2	0.0832	<0.0832
83.2	<83.2	0.0832	<0.0832
83.2	<83.2	0.0832	<0.0832
83.2	<83.2	0.0832	<0.0832
83.2	<83.2	0.0832	<0.0832
83.2	<83.2	0.0832	<0.0832

Converting from CFU/100ml to CFU/L			
Missile Site H1 Primary Sample Numbers GL970629-GL970635			
Formula for Calculation (CFU/100 ml)*(1000ml/L)			
CFU/100 ml	CFU/L		Converting % Solids to mg/L Total Solids (TS)
4000	40000		Formula = (% TS/100)*(mg/L)
2000	20000		
1000	10000		% TS
2000	20000		mg/L TS
3000	30000		10.2
3000	30000		0.102
3000	30000		
Calculating CFU/mg TS		Calculating CFU/g TS	
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)	
CFU/ mg TS	CFU/ mg TS	CFU/g TS	
4080		4.08	
2040		2.04	
1020		1.02	
2040		2.04	
3060		3.06	
3060		3.06	
3060		3.06	
Converting from CFU/100ml to CFU/L			
Missile Site H1 Duplicate Sample Numbers GL970636-GL970642			
Formula for Calculation (CFU/100 ml)*(1000ml/L)			
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)
2000	20000		Formula = (% TS/100)*(mg/L)
3000	30000		
2000	20000		% TS
4000	40000		mg/L TS
1000	10000		5.1
6000	60000		0.051
3000	30000		
Calculating CFU/mg TS		Calculating CFU/g TS	
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)	
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS
1020		1.02	
1530		1.53	
1020		1.02	
2040		2.04	
510		0.51	
3060		3.06	
1530		1.53	

Converting from CFU/100ml to CFU/L			
Missile Site I1 Primary Sample Numbers GL970643-GL970649			
Formula for Calculation (CFU/100 ml)*(1000ml/L)			
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS) Formula = (% TS/100)*(mg/L)
12000	120000		
23000	230000		
100000	1000000		
20000	200000		
10000	100000		
10000	100000		
20000	200000		
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)	
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS
7200		7.2	
13800		13.8	
60000		60	
12000		12	
6000		6	
6000		6	
12000		12	
Converting from CFU/100ml to CFU/L			
Missile Site I1 Secondary Sample Numbers GL970650-GL970656			
Formula for Calculation (CFU/100 ml)*(1000ml/L)			
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS) Formula = (% TS/100)*(mg/L)
10	100	<100	
10	100	<100	
10	100	<100	
10	100	<100	
10	100	<100	
10	100	<100	
10	100	<100	
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)	
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS
82	<82	0.082	<0.082
82	<82	0.082	<0.082
82	<82	0.082	<0.082
82	<82	0.082	<0.082
82	<82	0.082	<0.082
82	<82	0.082	<0.082

Converting from CFU/100ml to CFU/L										
Missile Site J1 Primary Sample Numbers GL970657-GL970663										
Formula for Calculation (CFU/100 ml)*(1000ml/L)										
CFU/100 ml	CFU/L	Converting % Solids to mg/L Total Solids (TS)								
3000	30000	Formula = (% TS/100)*(mg/L)								
3000	30000									
23000	230000	% TS	mg/L TS							
130000	1300000	2.1	0.021							
50000	500000									
1000	10000									
3000	30000									
Calculating CFU/mg TS		Calculating CFU/g TS								
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)								
CFU/ mg TS	CFU/ mg TS	CFU/g TS								
630		0.63								
630		0.63								
4830		4.83								
27300		27.3								
10500		10.5								
210		0.21								
630		0.63								
Converting from CFU/100ml to CFU/L										
Missile Site J1 Secondary Sample Numbers GL970664-GL970670										
Formula for Calculation (CFU/100 ml)*(1000ml/L)										
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)							
10	100	<100	Formula = (% TS/100)*(mg/L)							
10	100	<100								
10	100	<100	% TS	mg/L TS						
10	100	<100	74.6	0.746						
10	100	<100								
10	100	<100								
10	100	<100								
Calculating CFU/mg TS		Calculating CFU/g TS								
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)								
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS							
74.6	<74.6	0.0746	<0.0746							
74.6	<74.6	0.0746	<0.0746							
74.6	<74.6	0.0746	<0.0746							
74.6	<74.6	0.0746	<0.0746							
74.6	<74.6	0.0746	<0.0746							
74.6	<74.6	0.0746	<0.0746							
74.6	<74.6	0.0746	<0.0746							

Appendix D

Minot Air Force Base, North Dakota

Table D-1 Missile Site K1 and L1

Missile Site Sewage Lagoon Sludge Sampling Survey: 3 to 7 November 1997

Date Collected:		November 6, 1997		
Analysis Method	Analytes (ug/G)	Missile Site K1	Missile Site L1	
		Sludge piles	Sludge Spread	Remaining Sludge
SW 3050/6010B	Arsenic	4.5	3.3	3.62
SW 3050/6010B	Cadmium	1.31	1.1	1.02
SW 3050/6010B	Chromium	9.7	8.6	8.5
SW 3050/6010B	Copper	22	9.3	9.3
SW 3050/6010B	Lead	8.6	6.8	6.4
SW 3050/6010B	Molybdenum	<0.60	<0.60	<0.60
SW 3050/6010B	Nickel	21.7	14.1	15.3
SW 3050/6010B	Selenium	<2.0	<2.0	<2.0
SW 3050/6010B	Zinc	65.1	41	33.6
SW 7471A	Mercury	0.036	<0.048	<0.049
	Solids (%)	85.08	89.42	91.52
STD MTD 2540G	Solids (%)	85.08	89.42	91.52
EPA 350.1	Ammonia (mg/G)	0.0074	<.004	<.004
EPA 351.2	Kjeldahl Nitrogen (mg/G)	0.03	0.02	0.02
EPA 353.2	Nitrate/Nitrate Total (mg/G)	0.019	0.017	0.0238
	Base Sample #	GL970671	GL970672	GL970673
	OEHL Sample #	98004495	98004496	98004497

Appendix E

Survey Field Notes

The influent is in the center of each primary pond. There is no direct effluent between the primary and secondary pond.. When the primary pond needs to be drained CES Utilities pumps the water from the primary pond to the secondary pond.

Missile site B1 primary pond had a fuel odor, no sheen was noted.

Missile site F1 high alkali containing substance was applied to the area around the bank of the primary sewage lagoon at this site, a white ring on the bank of this pond was present during this survey.

Missile site H1 this site does not have secondary sewage lagoon.

Missile site I1 there was what appeared to be large amounts of cow manure in the secondary pond. Cow manure could increase the fecal coliform in the coliform sample.

Missile site J1 primary pond is located next to a surface lake or body of water. If sludge is land applied at this site there could be a potential to contaminate the lake with the run off from the sounding land.

Missile site K1 contractors were working on the secondary sewage lagoon. Sludge from the sewage lagoon was contained in approximately 90 to 100 piles of sludge, 4 ft high by 4 ft wide.

Missile site L1 Mr. Lambrecht requested additional sludge samples be collected from this site also. Contractors already moved sludge from the sewage lagoons. SSgt Hammes, 5 CES/COEIU does the routine maintenance on water utilities at the MAF and was a member of our sampling team. He indicated a few weeks ago that there were at least two large sludge piles at this site. SSgt Hammes noted upon arriving that the large piles of sludge no longer existed at this site. MSgt Fields, MSgt Dohner and SSgt Hammes surveyed the site and the land adjacent land. We found a small pile approximately four feet tall by four feet wide by the secondary sewage lagoon and areas by both the primary and secondary ponds with dirt that had the same color as the pile of sludge. The pile of dirt looked like it had recently been spread. One sample from the remaining sludge pile and a sample from the area that looked like freshly spread dirt/sludge were collected at this site.

Except for missile site H1, all other sites had a primary and secondary sewage lagoon. Except for site D1 all other secondary sewage lagoon were dry. During this survey the secondary lagoon at missile site D1 was marshy.

Appendix F

REFERENCES

1. Biosolids Management Handbook; United States Environmental Protection Agency; Undated
2. Sludge Management Technical Report Sludge Compliance Evaluation and Requirements Identification Minot Air Force Base, North Dakota; Contract No. F44650-94-D0006; Ecology and Engineering; July 1997
3. Environmental Reporter Final Regulations; The Bureau of National Affairs, Inc.; 1997
4. 40 Code of Federal Regulations 503; United States Environmental Protection Agency; 1997